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Resource -Based, Strategic Group, and Industry Influences on Firm Performance.

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RESOURCE-BASED, STRATEGIC GROUP, AND INDUSTRY INFLUENCES ON FIRM PERFORMANCE

A Dissertation

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TABLE OF CONTENTS

ABSTRACT

This dissertation examines resource-based, strategic group, and industry influences on firm performance. The resource-based view of the firm and strategic groups research are two areas of organizational inquiry that have lacked both theoretical as well as empirical integration. This dissertation provides a critical first step towards that end. Three papers are presented that first develop – and then test – resource-based and strategic group influences on organizational performance. The primary findings of this dissertation are threefold. First, variance in organizational performance exists both within and between strategic groups. Second, the degree to which firm, group, and industry explained variance in organizational performance varied based upon performance measure. Third, in all cases, firms accounted for the lion's share of the variation in organizational performance. In conclusion, the key determinant of organizational performance is manager's capabilities to position their firm within their group as well as industry.

INTRODUCTION

The purpose of this dissertation is to enhance strategic management research by improving our understanding of how various decisions, processes, and environmental forces influence firm performance. Developing an understanding of how to achieve superior firm performance continues to be one of the primary goals of strategic management researchers (March and Sutton, 1997; Meyer, 1991; Summer et al., 1990). Specific factors affecting firm performance stem from a bewildering array of influences including differences in firm resources (Barney, 1991; Wernerfelt, 1984), the industry environments where firms operate (Dess & Beard, 1984; Porter, 1980), and influences emanating from within industry subsets of firms — referred to as strategic groups (Hunt, 1972; Porter, 1979). These multiple factors influence how firms differ, and how those differences effect firm performance (Carroll, 1993; Nelson, 1991).

In this dissertation I take the position that understanding firm performance can best be accomplished by examining firm characteristics in the context of the environments where they operate (Meyer, 1991; Rumelt, Schendel, & Teece, 1994; Summer et al., 1990). Thus, the goal of this dissertation is to build and test theory concerning multiple, multilevel influences on firm performance. I accomplish this goal by conceptually developing and empirically testing influences on firm performance derived from the firm, strategic group, and industry levels of analysis. To rigorously accomplish this broad goal, the organization of this dissertation is as follows. I will present three papers that first develop and then test firm, strategic group, and industry influences on firm performance. I will now briefly describe each paper's content and research goals.

The first paper in this dissertation is a conceptual treatise that meets at the crossroads between two of strategic management's most investigated frameworks: the resource-based view of the firm and strategic groups research. Historically, assumptions behind these two views have put them somewhat at odds conceptually. Because the resource-based view of the firm argues that sustained competitive advantage is best attained when firms have unique resources (Barney, 1991; Wernerfelt, 1984), this view argues that analyzing differences in individual firm resources is the best strategy for understanding performance differences. In contrast, strategic groups research argues that a number of firms within the same industry can achieve sustained profitability if their strategies are similar to each other, but distinct from other industry members (Porter, 1979). Thus, this view argues that understanding differences in firm performance is best accomplished by conducting analyses at the within-industry group level of analysis. Recent work in strategic groups research has begun to bridge the gap between these two theories by suggesting that firm differences exist both within and between strategic groups (e.g., Cool & Schendel, 1988). That is, any given firm can closely follow the basic recipe that defines a strategic group and be a "core" member of that group, or loosely follow the group recipe and be a "secondary" group member (Reger & Huff, 1993). The goal of this conceptual paper is to develop propositions concerning contingencies when firm differences, group processes or both may lead to sustained competitive advantage. As well, I will provide implications for practitioners, as well as suggestions for future theory building and empirical tests combining the resource-based view and strategic groups research.

The second paper in this dissertation builds on the conceptual work above by testing organizational resource and strategic group influences on performance on a sample of hospitals during a time of considerable environmental change. I draw data from a single industry to provide a rich description of phenomena in an environment that has previously confirmed the existence of strategic groups. This empirical paper advances the field by simultaneously testing performance influences stemming from both the resource-based view of the firm and strategic groups research. I first hypothesize that both organizational and strategic group levels of analysis explain meaningful variance in hospital performance. Next, I hypothesize that strategic group characteristics will effect performance above and beyond organizational resources. Finally, I hypothesize that the effects of organizational resources will be more moderated by group characteristics.

To test strategic group performance influences I will derive strategic groups by clustering hospitals based on two variables indicating strategy type: source of competitive advantage and breadth of operations. By clustering, I am able to estimate group level variables that may explain organizational performance (e.g., average group operations breadth). I will test performance influences from multiple levels of analysis by using a hierarchical linear modeling technique (Bryk & Raudenbush, 1992; Hofmann, 1997). Specifically, this paper will use the HLM/2L statistical package (HLM: Bryk, Raudenbush, & Congdon, 1996) to partition the amount of variance in hospital performance that is explained by organizational and group levels of analysis. HLM also directly tests the main effects strategic group characteristics (i.e., source of competitive advantage) have on performance, and the moderating effects strategic group characteristics play in hospital resource — performance relationships.

The third and final paper seeks to investigate a more generalizable model by examining firms in multiple industries with data drawn from the COMPUSTAT database. While the hospitals sample data allows for a rich investigation with high internal validity, provides well-formulated strategic groups, and controls for industry differences, drawing from a single context compromises the generalizability of study findings. By examining multiple industries, the third paper builds on the second paper (i.e., hospital sample) by rigorously examining other contextual factors that may influence a firm's ability to achieve superior performance. Notable environmental influences stem from industry differences (Porter, 1980). I hypothesize three specific industry influences affecting strategic group influences on firm performance: Resource abundance (i.e., munificence), volatility (i.e., dynamism), and complexity (cf. Dess & Beard, 1984; Keats & Hitt, 1988; Palmer & Wiseman, 1999). To analyze the effects of multiple level influences on firm performance simultaneously, I will use the HLM/3L statistical package to assess the amount of variance in firm performance that is explained by the firm, strategic group, and industry levels of analysis. As well, multiple independent predictor variables will be included at each level of analysis to shed light on *why* one level may be more influential than others. While it is widely accepted that both firm resources and environmental traits play a role in determining firm performance (Henderson and Mitchell, 1997; Mauri and Michaels, 1998; McGahan and Porter, 1997; Powell, 1996; Rumelt, 1991), this study is the first to test firm, strategic group, and industry influences in a single model. In sum, this study is undertaken to enhance the generalizability of the findings in my dissertation while simultaneously providing insights about how industry characteristics as well as strategic group membership influence firm performance.

This dissertation contributes to the field of strategic management both theoretically and empirically by explicitly examining the determinants of firm performance from a multilevel perspective. It contributes theoretically by juxtaposing resource-based and strategic group influences on firm performance. This research contributes methodologically by testing multilevel influences on firm performance in an explicitly multilevel model using a methodology that has yet to be applied to the strategic management literature. Finally, the dissertation answers the call from researchers who have advocated integrating the resource-based view of the firm with strategic groups research (Mahoney & Pandian, 1992), and testing influences of firm and contextual factors in a single model (Dranove, Peteraf, & Shanley, 1998; Keats & Hitt, 1988; Rouse & Daellenbach, 1999; Stimpert & Duhaime, 1997a).

THE DETERMINANTS OF FIRM PERFORMANCE: COUPLING STRATEGIC GROUP AND RESOURCE-BASED VIEWS

A top priority for strategic management researchers is to develop a better understanding of the decisions, actions, and processes that lead to superior firm performance (March & Sutton, 1997; Meyer, 1991; Summer et al., 1990). The strategic management field is set apart from related disciplines by the incorporation of multiple theoretical perspectives to aid in answering interesting and practical research questions such as the determinants of firm performance (Jemison, 1981a; Meyer, 1991). The application of multiple theoretical approaches can provide the basis for rich descriptions of organizational antecedents, actions, and outcomes (Combs & Ketchen, 1999).

The *resource-based view of the firm* (RBV) and *strategic groups research* (SGR) are two perspectives on organizations that have received considerable attention within the last decade (e.g., Mahoney & Pandian, 1992; Peteraf, 1993; Reger & Huff, 1993; Rouse & Daellenbach, 1999). The RBV argues that differences in firm resources and capabilities provide the basis for superior firm performance (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984). In the long run, the most profitable firms are able to attract resources that are valuable, rare, difficult to imitate and without substitutes (Barney, 1991). From this perspective, firms differ in their abilities to acquire and deploy resources needed for sustained competitive advantage.

SGR focuses on sets of firms within the same industry that follow similar strategies (Fiegenbaum & Thomas, 1995; Hunt, 1972; Porter, 1979, 1980; Reger & Huff, 1993; Thomas & Venkatraman, 1988). Membership in a strategic group can be an important contextual influence, altering interpretations, actions, and ultimately

performance (Dranove et al., 1998; Peteraf & Shanley, 1997; Reger & Huff, 1993). Under this view, firms need not be uniquely different in their resources and actions to attain above average performance within an industry.

There is considerable appeal in pairing SGR with the conceptual framework of the RBV. While the goal of both views is to explain firm performance, they have traditionally offered different prescriptions for achieving superior profitability. The RBV seeks to understand how the accumulation of unique resources is responsible for creating superior firm performance. In contrast, the theoretical models that underlie SGR have traditionally assumed that groups of firms can achieve above-average industry performance despite similarities in terms of strategies and strategically relevant resources (Mascarenhas & Aaker, 1989; Porter, 1980, 1981; Rumelt, 1984; Scherer, 1980). While both views share the perspective that firms position themselves so that their strategies are difficult to imitate, they differ in their basic recipes for deterring imitation. The RBV argues that individual firms use "isolating mechanisms" to frustrate imitation of their unique strategy (Rumelt, 1984). In contrast, advocates of SGR believe that subsets of firms within an industry may generate superior performance when mobility barriers hinder strategy imitation by industry competitors (Hunt, 1972; Mascarenhas & Aaker, 1989; Porter, 1979). Despite the aforementioned differences, the belief that firm performance is dependent upon manager's decisions is germane to both views. For example, supporters of the RBV acknowledge firm performance is influenced by managerial choices, social competencies, and aspirations (Ginsberg, 1994). Likewise, strategic group theorists contend that firm superiority is partly a function of manager's efforts to place their firm within a strategic group and to look towards group performance

levels when setting aspiration levels (Fiegenbaum & Thomas, 1990; Peteraf & Shanley, 1997). Thus, while significant rationales separate these views, they are not altogether incompatible.

Neither perspective, used in isolation, has provided the "answer" for why some firms outperform others. Hence, simultaneous consideration of the RBV and SGR has the potential to yield considerable insights about how firms can achieve superior performance within their competitive environments (Mahoney & Pandian, 1992; Rouse & Daellenbach, 1999). To progress towards that end, the goal of this paper is to work toward integration of these two perspectives' disparate insights on the determinants of firm performance. To further this goal I briefly review the RBV and SGR. I then offer propositions about how both firm resources, strategic group characteristics, or both influence strategic actions and outcomes. I conclude with implications for organizational decision-makers and guidance for future research.

Literature Review

Review of the Resource Based Perspective

The central tenet of the RBV is that superior firm performance is a function of the firm's ability to both accumulate and deploy scarce resources (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984). Resources can refer to specific assets as well as human competencies and intangible abilities (Barney, 1991; Peteraf, 1993). Under this view, resource accumulation is based on managers' rationally guided motives for efficiency, effectiveness and profitability (Conner, 1991; Oliver, 1997). Acquisition barriers associated with resource accumulation may yield long-term advantages for firms (Amit &

Schoemaker, 1993; Barney, 1986b; Penrose, 1959). Ideally, firm resources will lead to sustained competitive advantage when they are valuable, rare, without substitutes, and bundled in a manner so that the firm's resources, and thus strategies, are inimitable by current and future competitors (Barney, 1991).

In a field that has historically lacked a distinct paradigm, the RBV has emerged as a central perspective in strategic management (Conner, 1991; Mahoney & Pandian, 1992; Peteraf, 1993; Wernerfelt, 1995). The RBV has improved our understanding of diversification (Markides & Williamson, 1996), human resource systems (Lado & Wilson, 1994), organizational culture (Barney, 1986a; Fiol, 1991), strategic networks (Gulati, 1999), strategic regulation (Maijoor & Van Witteloostuijn, 1996) in addition to firm performance (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Grant, 1991; Peteraf, 1993).

Although the RBV has become the cornerstone for building understanding about competitive advantage in the field of strategic management (Peteraf, 1993), the basis for this perspective is by no means novel. Economists have long relied on a similar concept of Ricardian rents that can be generated from ownership of valuable land, labor, capital, and entrepreneurial abilities (Ricardo, 1817). The RBV is also similar to SWOT analysis in which strategy formulation progresses by analyzing the "fit" between a firm's positioning of its internal strengths and weaknesses with the environment's external opportunities and threats (Andrews, 1971; Ansoff, 1965; Porter, 1980). Originating at the Harvard Business School, this 'design' school of thought is based on the premise that firms are idiosyncratic. Hence, performance can best be studied by analyzing a firm's unique characteristics and traits (Mintzberg, 1990).

In sum, the RBV assumes firm performance is a function of holding and deploying unique resources. Desiring to equip their firms with scarce resources that will lead to superior performance, managerial choices drive the resource accumulation process. This view is well documented in the strategic management literature, and draws from classic economic thought as well. Although the RBV reflects a rich industrial organization economics heritage, this theory is distinct from other economic theories because it is relevant at the firm, not industry level of analysis and because the RBV argues that firm resource combinations can result in *persistent* above-average performance (Conner, 1991).

Review of Strategic Groups Research

Economists have long held that performance is essentially an industry construct (Bain, 1956; Mason, 1939). Researchers in strategic management, who hold that firm differences are critical for understanding performance, have challenged this notion (Barney, 1991; Keats & Hitt, 1988; Nelson & Winter, 1982; Rumelt, 1991). The allure of conventional industry analysis has been further tarnished by the introduction of the strategic group concept. SGR originated in Hunt's (1972) dissertation that found firms in the US appliance industry could be grouped based on differences in vertical integration, product diversification, and product differentiation. Firms within the industry faced different competitive threats depending on group membership. Arising from this early work, SGR is based on the premise that profits differ systematically among groups of firms within an industry because of market factors and similar asset profiles that are common to groups of firms (Porter, 1979). Porter (1980: 129) defines a strategic group as a "group of firms in an industry following the same or a similar strategy". Cool and

Schendel (1987: 1106) apply a more general definition and describe strategic groups as "firms competing within an industry on the basis of similar resource combinations of scope and resource commitments." Despite differences in semantics, researchers agree that strategic groups are naturally occurring subsets of firms that are more homogeneous in actions than other industry incumbents (Cool & Schendel, 1988).

The allure of studying strategic groups is that within an industry some groups may consistently outperform others. Indeed, a number of studies have found evidence for this assertion (e.g., Dess & Davis, 1984; Fiegenbaum & Thomas, 1990; Mehra, 1996; Nath & Gruca, 1997; Reger & Huff, 1993). Group performance is generally attributed to strategic group mobility barriers (Porter, 1980). Mobility barriers are structural attributes of the group that make group membership difficult (i.e., costly)(Caves & Porter, 1977). Examples include factors such as scale economies, access to distribution channels, or advertising and capital intensity at the group level (Porter, 1979). Attaining group membership is also difficult because firms within a group are mutually interdependent, therefore they anticipate, monitor, and react to fellow group member's actions accurately and quickly relative to non-group members (Peteraf & Shanley, 1997; Porter, 1979).

Resource-based vs. Strategic Groups Research: Assumptions and Implications

Before juxtaposing these two theories, it may be useful to contrast their basic assumptions (Bacharach, 1989). If the assumptions underlying two theories are fundamentally incompatible, any attempt toward pairing the two views is impossible. If fundamental assumptions are not at odds, however, pairing the two views can be fruitful (Bacharach, 1989). The RBV and SGR are both the offspring of economic research, and they hold similar assumptions in other important areas. First, performance is *the key*

dependent variable. Second, both perspectives argue that managers aspire to make rational decisions. Third, both views argue that superior performance is achieved when managers position their firms in such a manner so that strategy imitation is difficult. Under the RBV, managers endeavor to create "isolating mechanisms" that protect individual firms from imitation and thereby preserve their high performance (Rumelt, 1984). Under SGR, however, "mobility barriers" serve to separate similar acting groups of firms in an industry (Caves & Porter, 1977; Mascarenhas & Aaker, 1989). The higher the mobility barrier, the greater the group's ability to prevent imitation and the greater the potential for high profits by group members (Porter, 1979).

Despite the similarities between the RBV and SGR just mentioned, the prescriptive implications of these two views are somewhat at odds. The RBV asserts that firms should strive to position themselves in such a manner so that no other firm can duplicate their unique resource bundle. In contrast, SGR suggests that commonalties across firms can be good. Mutual interdependence among firms may allow insulation from rivalry because some groups have superior bargaining power with buyers and suppliers, and face less of a threat from substitute products in other industries (Dranove et al., 1998; Porter, 1980). In this view, firm resource bundles will be unique between groups, but similar within.

Pairing these two views can be accomplished by examining how managers' choices and actions drive the accumulation of idiosyncratic firm resources as well as decisions about competitive position within a strategic group. While the collective beliefs of organizational members about how a firm is unique can play a critical role in organizational interpretations and actions (Albert & Whetten, 1985; Dutton & Dukerich,

1991), managers also perceive and respond to firms that are similar in strategy (Peteraf & Shanley, 1997; Porac, Thomas, & Baden-Fuller, 1989; Porter, 1980). Thus, both individual and group processes may influence interpretations, actions, and outcomes.

While little has been done to conceptually integrate the RBV and SGR, anecdotal evidence suggests this pairing is warranted. In particular, the following example illustrates how both shared group and unique firm factors play a role in determining firm performance. The worldwide auto industry has traditionally been explained in terms of individual firm differences within larger groups. The "big three" US automakers are commonly referred to as a group in the business press (e.g., Hughes, 1997; Taylor, 1997). Compared to foreign automakers, US manufacturers make strategically similar decisions in many areas such as the number and types of suppliers, length of contracts, supplier selection criteria, pricing practices, as well as quality (Cusumano & Takeishi, 1991). These group differences have definite implications for firm performance. For example, because Japanese automakers have chosen to invest in more specialized assets than their American counterparts, they have excelled over the big three in terms of both quality and profitability (Dyer, 1996). Despite commonalties among the big three, firms within that group can be easily distinguished by their uniqueness. The distinctive competence at Chrysler has been engineering (Breer, 1995). Ford has traditionally focused on operations (production line) and cost. GM has traditionally outperformed both Chrysler and Ford due to benefits from their superior economies of scale (Porter, 1980). Thus, differences in firm resources have served to differentiate automakers and their reputations over time (Rao, 1994).

In sum, despite the paucity of extant theoretical integration, there is evidence to suggest that both shared group characteristics as well as unique firm resource differences have the ability to lead to superior performance. Indeed, some researchers have concluded that significant differences in firm performance can be profiled by examining differences within strategic groups (Cool & Schendel, 1988; Lawless, Bergh, & Wilsted, 1989; Reger & Huff, 1993). Through strategic choices, managers have discretion to decide along which dimensions they will be similar to the group and which they will be different. Next, I make propositions about how firm resources, strategic group characteristics, or both may lead to enhanced performance.

Achieving Superior Performance: Coupling the Two Views

The RBV and SGR both argue that competitive barriers are used to make strategy duplication more difficult. Examination of these two independent research streams reveals that many researchers have unwittingly acted as though the same resources that are valuable for firms are also valuable for groups. Indeed, empirical investigations of the RBV and SGR have operationalized the same constructs when attempting to predict performance differences (Table 1). For example, both Balikrishnan and Fox (1993) and Fiegenbaum and Thomas (1990) consider a firm's financial leverage to be a critical

Table 1. Examples of Measures Used to Define Resource-based and Strategic Group Uniqueness

Measure	Resource-based study	Strategic group study
Current ratio	Schoenecker & Cooper, 1998	Fiegenbaum, Sudharshan, & Thomas, 1990
Forecasted growth	Balakrishnan & Fox, 1993	Dess & Davis, 1984
Size	Hansen & Wernerfelt, 1989	Porter, 1979
Leverage	Balikrishnan & Fox, 1993	Fiegenbaum & Thomas, 1990
R&D intensity	Mauri & Michaels, 1998	Hergert, 1987
Capital intensity	Stimpert & Duhaime, 1997a	Hatten & Schendel, 1977

characteristic influencing performance. Depending on philosophical slant, researchers have argued that either firm or group is the appropriate level of analysis or aggregation. Because previous research has been grounded in one perspective, researchers have not examined how both firm *and* group characteristics may affect firm performance.

In the following sections, I elaborate on a number of situations when firm resources, group influences, or both may shape a firm's actions and performance. Providing a thorough pairing of resource-based and strategic group influences on firm performance requires a framework that broadly spans the field of strategic management. I rely on one provided by Summer and his colleagues (Summer et al., 1990). Their conceptual framework circumscribes the field of business policy and strategy by including four main components: strategy, leadership and organization, environment, and performance (Figure 1). Although no universally accepted framework can address every aspect of the field, this scheme was developed by a number of leading scholars in strategic management and reflects early influential developments by Coase (1937), Mason (1939), Bain (1956, 1968), and Learned, Christensen, Andrews, and Guth (1965). This framework is used in the following sections to make propositions about how firm resources and strategic group characteristics influence and are affected by strategy, leadership and organization, and the environment. Notably, these influences have implications for firm performance.

Strategy

A firm's strategy reflects choices about the range of businesses the firm operates in and the competitive approach used by these businesses (Porter, 1980; Summer et al., 1990). Decisions about how the firm chooses to differentiate in a market are reflected in

a firm's business strategy. The RBV and SGR have tended to focus on different aspects of business level strategy. SGR has been interested in business level strategies that are common or generic across firms (Dess & Davis, 1984; Porter, 1979, 1980). In empirical investigations, strategic groups researchers have generally focused on commonalties in strategically relevant variables that are important for predicting firm performance in specific industries. Unfortunately, SGR has generally been criticized for lacking a strong

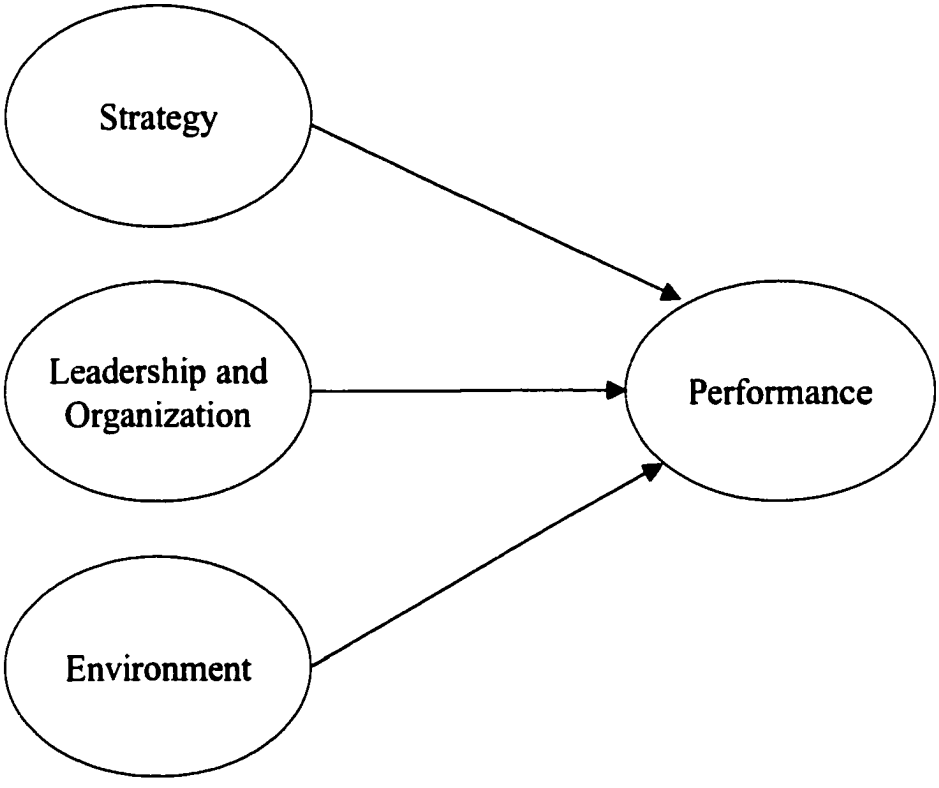

Figure 1: Influences on firm performance in the field of business policy and strategy. Adapted from Summer et al., 1990.

theoretical foundation and little commonality exists in terms of characteristics that may be relevant across industries (McGee & Thomas, 1986; Thomas & Venkatraman, 1988). Perhaps general knowledge about groups has been limited because few studies have proceeded with an *a priori* basis for defining unique groups of firms within an industry (Ketchen, Thomas, & Snow, 1993). Instead, the majority of studies have inductively defined groups based on patterns that emerge from analytical techniques and "assumed" these clusters represent a coherent set of actions and resource commitments that are shared by group members (Ketchen et al., 1993). While a few studies have progressed by defining groups based on theoretical typologies such as Porter's generic strategies (e.g., Dess & Davis, 1984) or Miles and Snow's (1978) prospectors, analyzers, and defenders (e.g., Bantel, 1998; Ketchen et al., 1993), these studies have been the exception rather than the rule.

The RBV is primarily interested in how firm strategies are idiosyncratic for individual firms in an industry (Barney, 1991; Mauri & Michaels, 1998; Peteraf, 1993; Schoenecker & Cooper, 1998). Although researchers in this scheme do not deny that commonalties might exist across groups of firms, their interests lie in understanding business level strategy as a quest for differentiation through unique resource accumulation. Consequently, the RBV allows for fine-grained insights about a firm's strategy relative to its competitors (Foss, 1996). The differences that yield superior performance are determined by the distinct abilities of a firm and its management to accumulate and implement strategic resources (Barney, 1991; Mauri & Michaels, 1998; Peteraf, 1993; Schoenecker & Cooper, 1998). Thus, while generic strategies may be used

to label a firm's basic strategic focus, these broad generalizations are not useful for understanding differences that lead to a sustained competitive advantage.

A small group of scholars (e.g., Cool & Schendel, 1988; Lawless et al., 1989; Reger & Huff, 1993) has begun to look for differences inside of strategic groups that may lead to performance. These researchers argue that differences within, as well as among strategic groups may be critical for superior performance. The idea that certain resources are more critical in some strategic groups than in others is consistent with Porter's (1980) view that firm's will be positioned within their strategic groups based on "structural" differences. Thus, both strategic group membership as well as a firm's specific resource endowments have the ability to influence firm performance. If this is truly the case, it seems as if an important question of interest to researchers in both views has been long overlooked. Namely, what level of analysis – firm, strategic group or both is responsible for influencing firm performance?

Investigations about which level of analysis has the strongest effects on firm performance represent an important dialogue in strategic management research. Indeed, a strong history in the strategy literature has tested the disparate influences of firm and industry effects to determine which level of analysis is more important for understanding firm performance (Brush & Bromiley, 1997; Brush, Bromiley, & Hendrickx, 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert, Phillips, & Westfall, 1996; Rumelt, 1991; Schmalensee, 1985). This lively debate is apropos in a field whose distinctive approach is to examine performance influences from multiple levels of analysis (Meyer, 1991; Summer et al., 1990). Given the wealth of conceptual

evidence that firm's unique resources as well as strategic group membership have distinct performance implications, I propose the following,

Proposition 1: Both strategic group membership and a firm's resource bundle explain a unique component of firm performance variance.

The limited research that has examined both firm uniqueness and similarity to the group has tended to frame uniqueness or similarity in black and white terms, where a firm is either labeled as representative or deviant from the group's basic defining traits. Specifically, Reger and Huff (1993) make a distinction between "core" firms that closely follow the strategic group recipe, and "secondary" firms that follow the recipe more loosely. Similarity or uniqueness, however, might be better understood in terms of shades of gray where a firm may be representative of the group on one characteristic but deviant in another.

Understanding similarity or uniqueness may be furthered by more concise definition of the strategic group construct. Within a given industry, it is likely that groups of firms may be similar on several characteristics. Only some dimensions, however, will be strategically relevant at the group level. Researchers have provided several suggestions for improving group definition. Some have argued that strategic group definition should be based on *a priori*, deductively defined theoretical frameworks (Dess & Davis, 1984; Ketchen et al., 1993). Others have argued that the link between group membership and firm performance be made by measuring unquestionably group traits such as group bargaining ability with customers or suppliers (Dranove et al., 1998).

Improving understanding of how group membership influences performance allows for incorporation of resource-based explanations. I agree with others who argue that group membership should be based on similar actions stemming from group

processes (Dranove et al., 1998). Within a group, though, differences may exist based on the unique accumulation of resources among firms.

Explanation of exactly how strategic group membership might influence resource influences on performance has been absent from both literatures. I take the position that characteristics of strategic group membership moderates the relationship between firm resources and performance. That is, the ability of resources to enhance firm performance is dependent on the core characteristics of a strategic group.

The following example illustrates how both strategic group and resource-based explanations can improve understanding of firm performance. Consider a firm in the pharmaceutical industry. For some firms in this industry, a capability in research and development is necessary if the firm shares membership in a group where high R&D spending is a core characteristic that defines the group (i.e., it is a mobility barrier). However, for the firm to achieve differentiation on innovation, it will have to spend more on R&D than other group members. For example, one relevant characteristic that defines competition in the pharmaceutical industry is the extent that companies focus on brand name versus generic drugs. Firms focusing on brand name drugs are likely to be in strategic groups marked by high mobility barriers in R&D spending in comparison to firms focusing on the efficient manufacturing of generic drugs. In the case where R&D expenditures are not a core characteristic of the group, a firm can spend less to differentiate itself on R&D within the group. Stated formally,

Proposition 2: Strategic group characteristics moderate the relationship between firm resources and performance.

Researchers of the RBV and SGR have made few prescriptions concerning the value that might accrue from holding resources that are similar or unique to other

members in a given strategic group. A starting point for this question may be gained by heeding Porter's (1980) warning that firms not pursuing a clear course of action and selecting a viable strategy run the risk of becoming stuck in the middle and experiencing poor performance. However, whether a firm becomes "stuck in the middle" or not is likely to depend on both the firm's resource bundles in relation to others in their group. Firms must hold and deploy at least the group average of key resources in order to yield group average performance. To achieve performance above the group average, firms must have additional resources beyond those required for group membership. Additional resources enable the firm to differentiate itself from others in the group, allowing for enhanced performance.

Proposition 3: Resource accumulation above the group average positively affects firm performance.

Leadership and Organization

Skilled top management can be a key resource in obtaining sustained competitive advantage for the firm (Castanias & Helfat, 1991). One critical task of strategic leaders is setting aspiration levels, or goals, that guide the firm's resource commitments (Barnard, 1938; Cyert & March, 1963). These aspirations will in part be determined by the firm's conceptualization of its uniqueness. In this section, I juxtapose the RBV and SGR to make propositions concerning how these perspectives in tandem might explain key aspects of organizational identities and aspirations.

Identity. Strategic leadership plays a prominent role in shaping organizational identity (Albert & Whetten, 1985; Dutton & Dukerich, 1991; Fiol, 1991). Organizational identity consists of the collective beliefs about the organization that are distinctive, central, and enduring (Albert & Whetten, 1985). Identity content acts as a perceptual

lens, influencing organizational issue interpretations and responses (Dutton & Dukerich, 1991). Because one of the central functions of top executives is developing a vision and sharing that vision with employees (Barnard, 1938; Senge, 1990), top managers are in a unique position to develop the organizational identities of their firms. This is an important task because an organization's identity can serve as a unique resource leading to sustainable competitive advantage for firms (Fiol, 1991).

Managers may perceive their firms to have highly unique firm identities (Brown, 1997; Dutton & Dukerich, 1991; Dutton, Dukerich, & Harquail, 1994; Fiol, 1991), suggesting that they may find little value from group labels imposed by others. Other firms, however, hold strong identities as members of a strategic group and adopt a group identity (Peteraf & Shanley, 1997). Similar to organizational identity, Peteraf and Shanley (1997: 166) define a strategic group identity as "a set of mutual understandings, among members of a cognitive intraindustry group, regarding the central, enduring, and distinctive characteristics of the group." They argue that strategic group identity will be strong when groups of firms perform similarly, are geographically close, and share network and resource similarities.

Individual firms may have both group identities as well as identities surrounding their uniqueness. Albert and Whetten (1985) illustrated the concept of dual identity by describing how the modern research university has a normative identity associated with the accumulation of knowledge as well as a utilitarian identity concerned with productivity and economic rationality. Important performance implications are associated with the strength of each identity because identity influences organizational actions. Within a strategic group, some firms will consistently follow the group recipe,

closely following similar resource holdings and making similar actions with other "core" group members (Reger & Huff, 1993). Other firms, however, will act more as "secondary" group members, following the group strategy less consistently. Firms holding a strong group identity will likely follow the core strategy of the group, while firms without strong groups identities are more likely to act as secondary group members. Thus,

Proposition 4: Core strategic group members have stronger group identities than secondary group members.

The interpretations that arise from holding an appropriately strong firm or group identity have important implications for firm performance. Because stable environments do not necessitate frequent interpretations (Dutton, 1993; Louis & Sutton, 1991), a strong strategic group identity will likely lead to superior performance as long as the identity encourages a firm to accumulate resources similar to other members in a high performing strategic group. In such environments, consistent firm actions may lead to reliable profits. In contrast, turbulent environments require frequent adjustments (Thomas, 1996). Holding to a strong group identity may lead to erroneous interpretations as industry conditions change the competitive landscape (Reger & Palmer, 1996). In turbulent environments, historical trends and group dynamics are no longer of value (D'Aveni, 1994). These considerations suggest the following propositions.

Proposition 5: In stable environments, firm performance will be high when both firm and group identity are strong.

Proposition 6: In turbulent environments, firm performance will be high when firm identity, but not group identity, is strong.

Aspirations. Manager's mental models are resources that can be a source of sustained competitive advantage for some firms due to superior creativity, intelligence,

and strategic planning (Ginsberg, 1994; Senge, 1990). These intellectual resources play a part in developing aspirations because they affect management's propensity to focus on certain aspects of the firm over others (Ocasio, 1997). While most of the work on aspirations has been conducted on individual managers and firms, the strategic group literature has the potential to extend our knowledge about how aspirations and goals affect performance.

Strategic groups researchers have suggested that perceived membership has important implications for firm performance because group membership acts as a sensemaking mechanism (Reger & Huff, 1993; Peteraf & Shanley, 1997; Porter, 1980). This notion is supported by social psychologists who have long argued that individuals have a natural tendency to compare themselves to others they perceive to be similar (e.g., Festinger, 1954). As organizational sensemakers, managers may use understandings based on a group of firms to navigate their competitive environments (Reger & Palmer, 1996; Porter, 1980). Hence, managers with a strong strategic group identity may use group performance as an aspiration level to guide their firm's actions (Fiegenbaum & Thomas, 1990).

The influence of group association on the sensemaking process has several implications for a firm's strategic actions and resultant performance. Strategic reorientation can only occur when a discrepancy exists between manager's aspirations and past performance (Lant, Milliken, & Batra, 1992; Milliken & Lant, 1991). A strong strategic group identity may decrease a firm's search for new ideas if group processes, interpretations, and actions become habituated within the group. If this is the case, strong strategic group identity may lead firms to justify poor performance if they associate poor

performance as a group phenomenon. Indeed, empirical evidence supports the notion that firms will justify poor performance when it is experienced by other firms they perceive to be salient comparators (Barr, Stimpert, & Huff, 1992). In this case, an individual firm's aspirations may be lowered by strong group identity.

Strategic group identity may in some cases increase aspirations. If performance is below expectations, a firm will experience an attainment discrepancy that will trigger a problemistic search (Cyert & March, 1963). If this is the case, they may alter their resources to improve performance. Aspiration levels may increase if a firm holds a strong identity as a member of a high performing group. As the firm raises their aspirations to match the performance of others in the groups, the firm will also necessarily alter resources to follow the group strategy. These actions have the potential to increase firm performance. Stated formally,

Proposition 7: Strategic group identity strength influences aspirations.

Environment

When attempting to understand the determinants of firm performance, research in strategic management has been built on the assumption that environmental influences play a significant role in performance achievement and sustainability (Child, 1972; Dess, Ireland, & Hitt, 1990; Hamel & Prahalad, 1994; Meyer, 1991; Porter, 1980; Summer et al., 1990). In the field of strategic management, the industry environment has undoubtedly been the most investigated environmental aspect (Wiersema & Bantel, 1993). Economists have long theorized that industry differences influence organizational performance (e.g., Bain, 1956), and strategists have identified multiple dimensions that differentiate industries (cf. Dess & Beard, 1984; Porter, 1980).

While numerous environmental aspects can be identified, Dess and Beard (1984) argue that three critical aspects capture the essence of the industry environment: munificence, dynamism, and complexity. These characteristics have been widely used in empirical operationalizations of the environment (e.g., Dess et al., 1990; Keats & Hitt, 1988; Lawless & Finch, 1989; Palmer & Wiseman, 1999; Sharfman & Dean, 1991; Weinzimmer, Nystrom, & Freeman, 1998). Thus, I make propositions based on each of these industry dimensions.

Munificence. Munificence is the extent to which environmental resources are available and accessible to firms (Aldrich, 1979; Starbuck, 1976). While munificence should be positively related to performance for all firms in an industry (Porter, 1980; Wiersema & Bantel, 1993), degree of industry munificence may favor some strategic groups over others (Ketchen et al., 1993). Munificence will enable groups of firms with certain strategic characteristics to benefit over other groups because of the role resource accumulation plays in their strategy. For example, firms that operate in a broad domain will likely benefit from the abundance of resources present in a growing industry (Carroll, 1984). In contrast, low environmental munificence should favor firms in strategic groups favoring a more specialized strategic focus (Ketchen et al., 1993). Lack of munificence generates limited organizational slack (Wiersema & Bantel, 1993), thus firms postured to accumulate specific resources are more adept to navigate through environments characterized by low growth. Thus, industry munificence moderates the effect of strategic group characteristics on firm performance. Stated formally,

Proposition 8: Industry munificence moderates the relationship between strategic group characteristics and firm performance.

Dynamism. Dynamism refers to environmental changes that are difficult to predict in terms of both frequency and direction. Because dynamic environments expose decision makers to considerable uncertainty (Dess & Beard, 1984; Jurkovich, 1974), average firm performance suffers (Wiersema & Bantel, 1993). Individual firms, however, can increase performance when they are positioned in strategic groups that are relatively buffered from the uncertainty. Indeed, Ketchen and colleagues (1993) found that strategic groups that were positioned to quickly adjust product offerings in response to changing demand characteristics outperformed groups that lacked this capability.

Environmental dynamism may also have important implications for a firm's resource decisions within a group. Dynamism has been found to moderate the relationship between insider ownership and firm performance (Li & Simerly, 1998), strategy consensus and firm performance (Homburg, Krohmer, & Workman, 1999), and rational decision making and firm performance (Priem, Rasheed, & Kotulic, 1995). Thus considerable evidence exists suggesting dynamism will affect several aspects associated with managerial habits and abilities, which are critical resources in dynamic environments. Other resources will also be affected by industry dynamism. For example, in Miller and Shamsie's (1996) study of Hollywood film studios they found that different resources led to financial performance in the stable, predictable environment of 1936-1950 than in the more uncertain environment of 1951-1965. In a dynamic market, performance will be enhanced when a firm can quickly gather resources necessary to achieve competitive advantage by reducing uncertainty. In sum, both group characteristics as well as firm capabilities both have the ability to lead to superior performance in dynamic environments. Stated formally,

Proposition 9a: In dynamic environments, high performance is a function of a firm's ability to quickly access valuable, rare, inimitable, and unsubstitutable resources based on a firm's unique capabilities

Proposition 9b: In dynamic environments, high performance is a function of a firm's ability to quickly access valuable, rare, inimitable, and unsubstitutable resources based on capabilities derived from strategic group membership.

Proposition 9c: The degree of environmental dynamism will moderate the importance of a firm's unique resources on performance.

Complexity. Complexity is characterized by the number and diversity of competitors, suppliers, buyers, and other environmental actors that firm decision makers need to consider when formulating strategy (Bourgeois, 1980; Dess & Beard, 1984). As environmental complexity increases, so does industry rivalry and competition. The idea that industry competition shapes firms' strategies and capabilities is well documented in the literature of economics as well as both the ecological and strategy traditions. Despite adequate conceptual grounding, few scholars have linked competitive influences to the actions of firms and groups (Henderson & Mitchell, 1997).

Perhaps the lack of interface between firms, groups, and environments is a function of the strategy field's strong reliance on economic theory. Traditional economic thought has generally focused on one aspect of the competitive environment — industry concentration — and asserted that on average, firm performance is higher in highly concentrated industries (e.g., Bain, 1956, 1959; Caves, 1972; Koch, 1974; Mann, 1966). The basic logic underlying this argument does not deny that resource differences may differentiate competitors in consolidated industries, but rather asserts that firms in concentrated industries have little incentive to engage in competitive actions because mutual interdependence encourages higher prices and profits for all industry incumbents (Porter, 1980).

Degree of industry complexity plays an important role in determining how a firm's unique resource bundles as well as strategic group characteristics play a role in determining firm performance. Complex environments involve considerable variety in the number and diversity of strategic groups within an industry (Miles, Snow, & Sharman, 1993). Thus, considerable differences should exist in the mobility barriers and other characteristics that differentiate strategic groups and their members. In industries marked by high industry complexity, strategic group membership will likely have important implications for firm performance because there is great diversity in mobility barriers leading some groups to outperform others. In less complex industries, however, mobility barriers are generally high for all industry incumbents (Porter, 1980). In these industries, which tend to be more consolidated, all of the firms that exist in the industry must be able to overcome high mobility barriers. Firms in less complex industries are likely to be at the later stages of the industry life cycle (Porter, 1980), suggesting that they show less strategic variety (Miles et al., 1993). Thus, it is likely that a firm's unique resources rather than characteristics of the strategic group will play a more important role in determining firm performance.

Proposition 10: As industry complexity increases, a firm's unique resources will play more of a role in determining firm performance than strategic group characteristics.

Future Research Implications and Conclusions

I have made the argument that efforts to achieve superior performance will be aided by considering both firm resources and strategic group influences. Both practitioners as well as researchers stand to gain from integrating and acknowledging that both unique firm characteristics *and* group influences play a critical role in resource accumulations, allocations, and ultimately outcomes. In the following sections I outline

implications for practitioners and also make suggestions for combining elements from the RBV and SGR in future theoretical treatise as well as empirical tests.

Implications for Organizational Decision Makers

To achieve above average performance in today's hypercompetitive environment, managers must analyze and understand complex relationships surrounding their resources as well as the resource bundles of their competitors. A rich history in strategic management has aided in helping managers produce a fit between their firm's unique strengths and weaknesses and the opportunities and threats that exist in the environment. A combined knowledge of a firm's unique resources as well as any advantage of strategic group membership is necessary to fully understand firm positioning in the environment. Although every firm is ultimately unique, recognition of similar acting groups of firms can be invaluable when conducting competitive analysis (Porter, 1980).

To achieve superior performance managers must constantly reanalyze when unique firm resources or shared strategic group characteristics are more critical to achieving superior performance. As I have argued, in many cases both will be critical for long term competitive advantage. For example, in the late 1980s the US semiconductor industry was dramatically losing market share to foreign competitors. To ameliorate this trend, a group of firms in this industry pooled resources to effectively mount an attack against global competitors (Browning, Beyer, & Shetler, 1995). This cooperation acted as a source of competitive advantage for the firms in this group. Unique firm characteristics, however, continued to be critical. While maintaining the benefits of this group effort, Intel gained additional competitive advantage by differentiating their firm on branding and marketing, as well as quality (D'Aveni, 1994). As Intel's experience

suggests, managers should carefully examine when unique firm resources, strategic group characteristics, or both can lead to competitive advantage.

Managers must also incorporate firm resources and strategic group characteristics when developing their corporate level strategy. Indeed, a considerable amount of research has already adopted a RBV of corporate strategy (e.g., Markides & Williamson, 1994, 1996; Montgommery & Wernerfelt, 1988; Peteraf, 1993). The RBV provides insights into effective corporate level strategy by suggesting that managers pursuing related diversification may encounter enhanced performance when their diversification efforts allow a business to obtain valuable, rare, imperfectly tradable and costly to imitate resources (Markides & Williamson, 1996). Little guidance, however, has been given on how strategic groups might influence corporate strategy because the strategic group concept has been focused largely on business level strategy. Consequently, few studies have examined diversified firms. Anecdotal evidence, however, suggests an increasing role played by strategic groups on corporate strategy. For example, AT&T's highly touted acquisition into the cable television market has encouraged other telecommunications firms to diversify into this industry. Hence, when considering a strategic acquisition, managers should be aware of any strategic group characteristics that may enhance or detract from the attractiveness of their potential acquisitions. Clearly, managers diversification decisions will be improved when they consider both unique firm and group influences that will allow them to posture their firm to achieve competitive advantage and superior performance.

Implications for Theory Building

Integration of the RBV and SGR should prove fruitful, especially for building theory surrounding corporate level strategy. For example, diversification has considerable implications for corporate performance and remains one of the central topics of interest in strategic management research (Hitt, Gimeno, & Hoskisson, 1998). Researchers attempting to incorporate information integrating firm resources and strategic group characteristics into corporate level strategy formulations might begin by drawing on research in strategic networks. Network researchers have begun to integrate the RBV into their conceptual frameworks by arguing that managers can create value for their firms by integrating their resources in network relationships with other suppliers, customers, or distributors that enable value to be added to their firm (Gulati, 1999; Stabell & Fjeldstad, 1998). The effect of bargaining power of groups of firms in strategic networks may also play a substantial role in improving firm performance.

Managers create networks by engaging in strategic alliances or acquisitions. Inasmuch as corporations follow similar acquisition strategies to achieve superior network structures, strategic groups within a given industry may also become a factor. As a number of corporations engage in multipoint competition by diversifying into the same markets following the same strategy, the content of strategic groups in an industry may be altered. Important performance implications can be drawn from such actions. Corporations that diversify by acquiring a firm in an attractive strategic group will likely improve their performance. On the contrary, corporations that acquire a firm in an unattractive strategic group may watch their corporation's performance erode.

Manager's diversification decisions are driven by their ideas of relatedness (Prahalad & Bettis, 1986), which can be conceptualized in many ways (Stimpert & Duhaime, 1997b). Future theoretical research should investigate how unique firm resources and strategic group membership affect manager's cognitions and thus influence corporate diversification decisions. For example, holding a strong unique firm identity may discourage some corporations from making acquisitions in some strategic groups because they would consider these acquisitions to be inconsistent with their conceptualizations of relatedness. As well, managers of firms with low levels of diversification may be tempted to make acquisitions of firms that operate in strategic groups similar to their dominate business. In contrast, managers of highly diversified firms will probably not be biased in this fashion.

The pairing of the RBV and SGR offers many additional opportunities for theoretical integration. For example, how do individual firm resource choices affect the structure of the strategic group over time? When is it advisable for an individual firm to enter or leave a group? Can individual firms achieve a sustainable competitive advantage by creating unique isolating mechanisms at one point in time, and collaborating to form group entry barriers at other time points? Many fruitful investigations considering both firm resources and strategic group characteristics remain.

Implications for Theory Testing

Our knowledge of firm resource and strategic group influences on performance can be furthered by rigorous empirical tests incorporating elements from both of these views. The differing theoretical bases underlying the RBV and SGR have historically lead to distinct research strategies. Because the RBV assumes heterogeneity in resources

and performance, studies of this view have logically relied on regression analysis in empirical investigations (e.g., Schoenecker & Cooper, 1998). In contrast, SGR generally has assumed homogeneity among group members and explored systematic differences in group performance. Under this view, empirical investigation has used a variety of methods to cluster firms into groups (Ketchen & Shook, 1996), and then examine group differences (i.e., main effects of group characteristics on performance) using ANOVA/MANOVA techniques (e.g., Cool & Schendel, 1988; Fiegenbaum & Thomas, 1990, 1995; Lewis & Thomas, 1990). In this section, I provide guidance for researchers with the hope that they will include elements from both the RBV as well as SGR into future empirical tests.

Essentially, a level of analysis debate has hindered empirical integration of these two views. The RBV argues that firms are the appropriate unit of analysis, while strategic groups researchers propose group level investigation is warranted. If both views have merit, then previous research has made a number of theoretical and methodological errors. For example, if groups have an influence on individual performance, studies conducted solely at the individual level of analysis have violated the independence of observations assumption that underlies traditional statistical approaches (Bryk & Raudenbush, 1992; Hofmann, 1997). If individuals have an influence on performance, studies examining only group influences on performance have discarded potentially meaningful lower level variance (Hofmann, 1997). If both influence firm performance, researchers have failed to investigate substantive research questions such as which level accounts for more variance in firm performance.

It is notable that this level of analysis debate is familiar to other disciplines that engage in organizational research. In the organizational behavior literature, studies of work group applications have similarly endeavored to understand which level of analysis (i.e., individual or group) more strongly influences individual performance (Hofmann, 1997). Across disciplines, educational researchers have faced similar challenges when determining if child, class, or school is the best level to investigate when attempting to predict academic performance (Bryk & Raudenbush, 1992). Within our own field, a lively debate continues to test whether firm or industry accounts for more variance in firm performance (Brush & Bromiley, 1997; Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985). The strategic group level of analysis, however, has been ignored in such studies. Thus, our understanding of how firms, strategic groups, *and* industries influence firm performance has been limited.

To empirically test resource-based and strategic group influences on firm performance, researchers should endeavor to employ techniques that allow testing of multiple levels of analysis simultaneously (Dranove et al., 1998; Rouse & Daellenbach, 1999). Within the last decade, statistical developments from other fields have allowed for the introduction of hierarchical linear modeling techniques that are appropriate for analyzing data at multiple levels of analysis. These techniques are well documented in the education literature (Bryk & Raudenbush, 1992), and have recently emerged in the management literature as well (e.g., Hofmann, 1997; Hofmann & Stetzer, 1998; Kidwell, Mossholder, & Bennett, 1997). These techniques hold great promise for researchers in strategic management.

Several additional issues are worth noting. When combining the two views, sample selection will likely play a role in substantive research conclusions. Because research in strategic groups has often studied a single industry with single business competitors, initial studies combining these two views should rely on rich investigations of firm resources and strategic group characteristics in a single industry setting composed of single business firms (Rouse & Daellenbach, 1999). An ideal setting for initial investigations would be an industry where there is previous theoretical and empirical evidence that strategic groups exist. Following formative inquiries concerning firm and group performance affects, researchers should attempt to establish generalizability by relying on multiple industry designs.

Another thorny methodological issue that arises when pairing these two views concerns how to handle diversified firms. While pioneering efforts to understand firm and group influences would be well advised to control for diversification by sampling from single business firms, ultimately diversification should be modeled and the efficacy of corporate resource bundles on performance can be assessed to understand firm performance (Markides & Williamson, 1996).

Conclusion

The RBV and SGR have largely ignored each other in relation to many relevant strategic issues that have important implications for firm performance. A more realistic picture can be seen when researchers acknowledge and investigate influences that occur both within and between groups. Both theoretical developments and empirical investigations stand to gain when insights and ideas stemming from both of these two views are acknowledged.

RESOURCE-BASED AND STRATEGIC GROUP INFLUENCES ON ORGANIZATIONAL PERFORMANCE IN THE HEALTH CARE INDUSTRY

Predicting firm performance continues to top many strategic management scholars research agendas (March & Sutton, 1997; Meyer, 1991; Summer et al., 1990). To accomplish this goal, strategy researchers have incorporated insights from numerous disciplines such as economics, administrative management, psychology, and marketing (Biggadike, 1981; Jemison, 1981a, 1981b; Porter, 1981). This blending of multiple perspectives to answer practical research questions such as the determinants of firm performance is one of the key qualities that distinguishes the field from related disciplines (Meyer, 1991).

Although rich conceptual integration has been encouraged in much strategy research, two key perspectives in the field — the resource-based view of the firm and strategic groups research — have largely ignored each other concerning how firms achieve superior performance (e.g., Mahoney & Pandian, 1992; Peteraf, 1993; Reger & Huff, 1993; Rouse & Daellenbach, 1999). The *resource-based view of the firm* (RBV) argues that differences in firm resources and capabilities provide the basis for superior firm performance (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984). From this perspective, performance is a function of manager's ability to acquire and deploy the resources needed to achieve sustained competitive advantage for their organization. *Strategic groups research* (SGR) focuses on sets of firms within the same industry that follow similar strategies (Cool & Schendel, 1988; Fiegenbaum & Thomas, 1995; Hunt, 1972; Porter, 1979, 1980; Reger & Huff, 1993; Thomas & Venkatraman, 1988). Membership in a strategic group can be an important contextual influence, altering interpretations, actions, and ultimately

performance (Dranove et al., 1998; Peteraf & Shanley, 1997; Reger & Huff, 1993). Under this view, firms need not be uniquely different in their resources and actions from all the industry's incumbents. Rather, similarity may be advantageous for some firms.

If both of these views have merit, then previous research relying on one perspective to the exclusion of the other has both theoretical as well as methodological limitations. Conceptually, overlooking one view in favor of the other ignores a significant line of research that has been supported in the literature. Methodologically, a level of analysis issue also confounds interpretation of previous empirical research. For example, if groups have an influence on individual performance, studies conducted solely at the individual level of analysis have violated the independence of observations assumption that underlies traditional statistical approaches (Bryk & Raudenbush, 1992; Hofmann, 1997). If individual firm resources have an influence on performance, then studies examining only group influences on performance have discarded potentially meaningful lower level variance (Hofmann, 1997). Subsequently, some researchers have argued for a test of the effect of strategic group characteristics on firm performance that controls for the effects of firm resources (Dranove et al., 1998). As well, empirical investigations of resource-based and strategic group explanations should use a single industry to control for industry attributes that affect strategic decisions (Rouse & Daellenbach, 1999). Such a test would increase the rigor over previous research, and serve to integrate SGR with the conceptual foundation of the RBV.

When used in isolation each of these two perspectives provides an incomplete picture of why some firms outperform others. Hence, simultaneous consideration of the RBV and SGR has the potential to yield considerable insights about how firms can

achieve superior performance within their competitive environments (Mahoney & Pandian, 1992; Rouse & Daellenbach, 1999). In this paper, I test the influences of firm resources and strategic group membership on firm performance in a single model. By investigating firm resource *and* strategic group influences on firm performance simultaneously, this paper works towards integration of these two perspectives' disparate insights.

Literature Review

Although the RBV and SGR approaches to achieving superior performance are both based in part by research within economics, they differ considerably in terms of the managerial actions taken to enhance organizational performance. In the following sections I briefly review the literature on both of these views, focusing on their separate insights for achieving superior firm performance.

Review of the Resource Based Perspective

The central tenet of the RBV is that firm profitability is a function of an organization's unique resource bundles (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984). Resources are broadly defined to encompass specific assets as well as human competencies and intangible abilities (Barney, 1991; Peteraf, 1993). Under the RBV, the performance of an individual firm is a function of managers' rational attempts to enhance efficiency, effectiveness, and performance by accumulating and deploying scarce resources (Conner, 1991; Oliver, 1997). Ideally, managers will strive to accumulate resources that are valuable, rare, without substitutes, and bundled in a manner so that the firm's resources, and thus strategies, are inimitable by current and future competitors (Barney, 1991).

Attaining such resources involves overcoming significant acquisition barriers (Amit & Schoemaker, 1993; Barney, 1986; Penrose, 1959). Thus, managers who are able to overcome these barriers place their organizations in a desirable competitive position.

The RBV has emerged as a central perspective in strategic management, providing a common thread in a field that has historically lacked a distinct paradigm (Conner, 1991; Mahoney & Pandian, 1992; Peteraf, 1993; Wernerfelt, 1995). The RBV has aided improved understanding of diversification (Markides & Williamson, 1996), human resource systems (Lado & Wilson, 1994), organizational culture (Barney, 1986a; Fiol, 1991), strategic networks (Gulati, 1999), strategic regulation (Maijoor & Van Witteloostuijn, 1996) in addition to firm performance (Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Grant, 1991; Peteraf, 1993).

Although the RBV has become a cornerstone for building understandings about competitive advantage in the field of strategic management (Peteraf, 1993), the basis for this perspective is by no means novel. Economists have long relied on a similar concept of Ricardian rents that can be generated from ownership of valuable land, labor, capital, and entrepreneurial abilities (Ricardo, 1817). The RBV is also similar to SWOT analysis in which strategy formulation progresses by analyzing the "fit" between a firm's positioning of its internal strengths and weaknesses with the environment's external opportunities and threats (Andrews, 1971; Ansoff, 1965; Porter, 1980). Originating at the Harvard Business School, this 'design' school of thought is based on the premise that firms are idiosyncratic (Mintzberg, 1990). Hence, understanding the determinants of firm performance can best be accomplished by analysis that focuses on a firm's unique resources and capabilities.

In sum, the RBV assumes firm performance is a function of holding and deploying unique resources. Desiring to equip their firms with scarce resources that will lead to superior performance, managerial choices drive the resource accumulation process. This view is well documented in the strategic management literature, and draws from classic economic thought as well. Although the RBV reflects a rich industrial organization economics heritage, this theory is distinct from other economic views because it is relevant at the firm, not industry, level of analysis and because the RBV argues that firm resource combinations can result in *persistent* above-average performance (Conner, 1991).

Review of Strategic Groups Research

The concept of the strategic group first originated with Hunt (1972), who observed distinct sets of firms in the major home appliance industry. Although Hunt focused primarily on the structure within industries, Newman (1973) provided evidence that differences in behavior across groups led to performance differences among groups. The most compelling conceptual foundation for the strategic groups – performance link was laid by the work of Porter (Caves & Porter, 1977; Porter, 1979, 1980), who argued that differences among groups in factors such as marketing methods, technologies, and capital requirements resulted in "mobility barriers" that insulated group members from potential group entrants.

Empirical work on strategic groups began to blossom in the late 1970s and continues to flourish. Despite considerable grounding conceptually as well as empirically, though, the evidence that group membership influences firm performance has been equivocal to date. While the link between group membership and performance

has been supported in numerous empirical studies (e.g., Dess & Davis, 1984; Fiegenbaum & Thomas, 1990; Mehra, 1996; Nath & Gruca, 1997; Reger & Huff, 1993), others fail to establish such a link (e.g., Barney & Hoskisson, 1990; Cool & Schendel, 1988). Differences in individual study outcomes may be attributable to numerous factors such as how variables used to define strategic direction are operationalized (McGee & Thomas, 1986), how strategic group membership is conceptualized (Ketchen et al., 1993), and how researchers "cluster" firms into groups empirically (Ketchen & Shook, 1996). Across studies, though, a meta-analytic review of the literature found that 8% of the variance in firm performance can be attributed to group membership (Ketchen et al., 1997).

Managerial actions are critical in determining firm performance within a group. Because firms within a group are mutually interdependent, managers within a group are more able to anticipate, monitor, and react to fellow group member's actions more accurately and quickly than non-group members (Peteraf & Shanley, 1997). Mutual understandings among group members about the central, enduring characteristics of the group constitute a strategic group identity that has the potential to lead to both positive and negative firm level outcomes (Peteraf & Shanley, 1997). Thus, both cognitive understandings as well as objective structural differences play a role in linking group membership to performance.

Relating the Resource-based View and Strategic Groups Research

The RBV and SGR have emerged as two of the most investigated conceptual frameworks for analyzing firm performance differences in the strategy literature. Despite continuing interest in these theories, conceptual integration of these two views is lacking (Mahoney & Pandian, 1992). The most marked difference between these views is found

in their divergent prescriptive implications. The RBV asserts that firms should strive to position themselves in such a manner so that no other firm can duplicate their unique resource bundle, while SGR suggests that mutual interdependence among firms may allow insulation from rivalry because some groups have superior bargaining power with buyers and suppliers, and face less of a threat from substitute products in other industries (Dranove et al., 1998; Porter, 1979). Thus, SGR argues that some determinants of firm performance are unique between groups, but similar within.

Pairing these two views can be accomplished by examining how managers' choices and actions drive the accumulation of idiosyncratic firm resources as well as decisions about competitive position within a strategic group. While the collective beliefs of organizational members about how a firm is unique can play a critical role in organizational interpretations and actions (Albert & Whetten, 1985; Dutton & Dukerich, 1991), managers also perceive and respond to firms that are similar in strategy (Peteraf & Shanley, 1997; Porac, Thomas, & Baden-Fuller, 1989; Porter, 1980). Thus, both individual and group processes may influence interpretations, actions, and outcomes. In sum, despite the paucity of extant theoretical integration, there is evidence to suggest that *both* shared group characteristics as well as unique firm resource differences have the ability to lead to superior performance.

Hypotheses

In the following sections, I elaborate how firm resources, group influences, or both may shape manager's actions and organizational performance. Specifically, I make hypotheses about how the RBV and SGR may together improve understanding of the effects of strategic actions on organizational performance.

Contributions of Group Membership and Firm Uniqueness on Performance

A firm's strategy reflects choices about the range of businesses the firm operates in and the competitive approach used by these businesses (Porter, 1980; Summer et al., 1990). The RBV and SGR have tended to focus on different aspects of business level strategy. SGR has been interested in business level strategies that are common or generic across firms (Dess & Davis, 1984; Porter, 1979, 1980). In empirical investigations, SGR has focused on commonalties in strategically relevant variables that are important for predicting firm performance in specific industries.

The RBV is primarily interested in how firm strategies are idiosyncratic for individual firms in an industry (Barney, 1991; Mauri & Michaels, 1998; Peteraf, 1993; Schoenecker & Cooper, 1998). Although researchers in this scheme do not deny that commonalties might exist across groups of firms, their interests lie in understanding business level strategy as a quest for differentiation through unique resource accumulation. Consequently, the RBV allows for fine-grained insights about a firm's strategy relative to competitors (Foss, 1996). The differences that yield superior performance are determined by the distinct abilities of a firm and its management to accumulate and implement strategic resources (Barney, 1991; Mauri & Michaels, 1998; Peteraf, 1993; Schoenecher & Cooper, 1998). Thus, while generic strategies may be used to label a firm's basic strategic focus, these broad generalizations are not useful for understanding differences that lead to a sustained competitive advantage.

Recent work in SGR has begun to bridge the gap between these two theories by acknowledging that differences in firm strategies and performance may exist both within *and* between strategic groups (Cool & Schendel, 1988). Indeed, Lawless, Bergh, and

Wilsted (1989) used separate analysis for group and firm influences on performance to conclude that both group characteristics and firm capabilities influenced firm performance. Reger and Huff (1993) argued that any given strategic group contains "core" members who compete by closely following the basic recipe that defines the strategic group, as well as "secondary" group members who loosely follow the group recipe (Reger & Huff, 1993). Thus, elements of both group membership and unique firm characteristics may influence performance.

If both firm uniqueness as well a group membership influence performance, an important question of interest to researchers in both views has been long overlooked. Namely, what level of analysis – firm, strategic group, or both, is most responsible for influencing firm performance? Investigations about level of analysis effects on firm performance represent an important dialogue in strategic management research. Indeed, a strong history in the strategy literature has tested the disparate influences of firm and industry effects to determine which level of analysis is more important for understanding firm performance (Brush & Bromiley, 1997; Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985). This lively debate is apropos in a field whose distinctive approach is to examine performance influences spanning multiple levels of analysis (Meyer, 1991; Summer et al., 1990).

Decomposing variance into organizational and group levels may further our understanding or resource-based and strategic group influences on performance. When examined together, several possibilities exist. For example, it could be that little variance exists at the group level, setting the value of strategic groups research as suspect. In

contrast, the majority of the variation in performance could be between groups with little variation within. Such a finding would question the merit of the resource-based explanations. Given the wealth of conceptual evidence that firm's unique resources as well as strategic group membership have distinct performance implications, I hypothesize the following,

Hypothesis 1: Both strategic group membership and a firm's unique resource bundle explain a unique component of firm performance variance.

The Effect of Group and Organizational Characteristics on Performance

While understanding the extent to which firms or strategic groups explain variation in firm performance can provide a valuable contribution to the literature, further insights can be gained by understanding *how* variables at each level of analysis influence performance. Of specific interest is the influence of strategic group membership on performance. Strategic groups researchers have implicitly argued for a direct link between group membership and performance. Group membership in and of itself, however, is not directly responsible for differentiating groups in terms of performance. Instead, it is likely that persistent structural features such as mobility barriers in certain key areas make group membership more attractive in some groups over others (Caves & Porter, 1977; Dranove et al., 1998; Mehra, 1996). Other specific group traits might include group bargaining ability (Dranove et al., 1998), or a strong group reputation or image (Peteraf & Shanley, 1997). Thus, the advantage of group membership is a function of specific characteristics that exist solely at the group level of analysis. These characteristics have been labeled as strategic industry factors, or resources that are valuable within an industry (as opposed to idiosyncratic resources) (Amit & Schoemaker, 1993; Mehra, 1996). Such characteristics are a distinct function of group processes and

actions, beyond any action taken by individual actors within the group. Researchers have argued that if such group processes truly exists, then their effects should be detected after controlling for possible resource influences (Dranove et al., 1998). Hence, I propose the following:

Hypothesis 2: Strategic group characteristics have a direct (i.e., main) effect on firm performance above and beyond that accounted for by firm resources.

Strategic Group Characteristics Moderate Firm Resources Effects on Performance

Group membership may also have an indirect affect on firm performance by changing the nature of the relationship between firm resources and performance within a group. The idea that certain resources are more critical in some strategic groups than in others is consistent with Porter's (1980) view that firm's will be positioned within their strategic groups based on "structural" differences. While all firms within a strategic group may receive some benefit from group membership, resource heterogeneity may influence within group performance differences (Cool & Schendel, 1988). Indeed, Reger and Huff (1993) found that firms closely representing the group's "core" defining traits outperformed firms following the group recipe less consistently. This notion is backed by considerable theoretical and empirical evidence stemming from the resource-based view that differences in firm resources and assets are critical determinants of firm performance differences (e.g., Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Lawless et al., 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984).

Despite conceptual and empirical evidence that both firm resources as well as group characteristics influence firm performance, little guidance has been given about the form of the relationship between resources, strategic group membership, and performance. I take the position that strategic group membership moderates the

relationship between firm resources and performance. That is, characteristics of the group alter the efficacy of firm resources to enhance performance. For example, firms overcoming substantial mobility barriers in marketing and R&D to position themselves into a group will likely find it even more difficult to differentiate their firms from other group members on these characteristics. Stated formally,

Hypothesis 3: Strategic group characteristics moderate the relationship between firm resources and performance.

Methods

Sample and Data

A sample was drawn from the U.S. healthcare industry. The use of the healthcare industry was attractive for several reasons. First, a single industry is desirable to provide a rich analysis of how firm resources and strategic group characteristics influence firm performance in a well-documented context (cf. Rouse & Daellenbach, 1999). Indeed, the existence of strategic groups has been well documented in this industry (Ketchen et al., 1993; Pegels & Sekar, 1989; Shortell, Morrison, & Friedman, 1990; Zajac & Shortell, 1989). Finally, hospitals are critical components of the healthcare industry, a segment of the U.S. economy that accounts for approximately 15% of the country's gross domestic product (Beekun Stedham, & Young, 1998).

To capture this competitive environment I further constrain my sample to a single metropolitan area. Sampling from a single geographic region is recommended when studying the health care industry, because there is evidence that competition within this industry is geographically based (Chiswick, 1976; Hambrick, 1982; Nath & Sudharshan, 1994). I obtained data from the Center for Health Care Industry Performance Studies, and from the Guide to the Health Care Field of the American Hospital Association.

Data were collected from the years 1988-92 from an entire population of 86 hospitals in a large metropolitan area in the northeastern United States (excluding Veterans' Administration hospitals, military-base hospitals, and university health centers). The years 1988-1992 were chosen to examine an environment that would be characterized by heavy competition for resources and diversity in the actions of environmental actors. This was the case among hospitals beginning in the late 1980s. Before 1986, most hospitals were reimbursed the full cost of patient care from third-party payers. However, after 1986 the Medicare Prospective Payment System was fully implemented, and hospitals were only reimbursed based on predetermined levels based on the medical condition treated. Thus, while hospitals once had the ability to generate profits by discretionary pricing policies, after 1986 hospitals needed to provide their services below the price limits to be profitable. The decision to use 1988 as the starting point of data collection is critical, because this represented the period of time immediately following the implementation of the new Medicare Prospective Payment System.

To enhance my ability to make causal inferences about multilevel influences on organizational performance, I used a lagged structure (Beekun et al., 1998; Palmer & Wiseman, 1999). Resources and strategic group characteristics were taken from the years 1988-1990, and performance measurements were taken from the years 1990-1992. Three years of organizational resource and performance data are needed to provide stable measures of organizational resources and performance (cf. Beekun et al, 1998; Keats & Hitt, 1988). One year of data overlap is chosen because some resources will have

immediate effects on performance, while other resources may take a number of years before their performance affects are fully realized (cf. Palmer & Wiseman, 1999).

Firm Resource Measures

A number of organizational resource categorizations have been presented in the literature (Black & Boal, 1994). I use the classification of Chatterjee and Wernerfelt (1991), which places organizational resources into three categories: physical, intangible, and financial. This classification is well grounded in the literature (e.g., MacDonald, 1984; Montgommery & Hariharan, 1990; Teece, 1982) and remains a popular resource classification framework (e.g., Schoenecker & Cooper, 1998). To operationalize organizational resources, I select two measures from each of these categories.

Physical resources. Physical resources embody the firm's physical technology, plant and equipment, geographic location, and access to raw materials (Barney, 1991). I use several measures to operationalize this construct. First, I use a measure of capital investment, or funds spent to improve the firm's facilities. A firm that makes a consistent commitment in capital expenditures is continually building their property, plant and equipment. As well, capital investment is a resource allocation that has been shown to have a strong relationship with firm performance across studies (e.g., Capon, Farley, & Hoenig, 1990; Stimpert & Duhaime, 1997a). Finally, capital investment represents an important strategic decision in the hospital industry (Beekun et al., 1998). To indicate capital investment I collected data on the total spending on buildings and fixtures measured in millions of dollars. In addition, I used an indicator variable to measure if the hospital was in an urban or suburban location. Location in the hospital industry can be a

critical resource effecting access to both customers and employees (Nath & Sudharshan, 1994).

Intangible resources. Intangible resources are assets and skills that are generally a function of human innovation or entrepreneurial ability (Michalisin, Smith, & Kline, 1997). To measure intangible resources for hospitals, I use the amount of direct medical education, defined as intern and resident salaries plus other direct costs divided by the number of full-time interns and residents (cf. Ketchen et al., 1993). Hospitals that wish to adopt a new technology must have qualified personnel to ensure that their technology is used both efficiently and effectively. Hospitals that spend more on direct medical education are making a commitment towards having a highly trained workforce capable of utilizing the most up to date technological healthcare equipment (Ketchen et al., 1993). Also, the amount spent on direct medical education plays an important role in influencing a hospital's reputation. Direct medical education expenses are measured in thousands of dollars. I supplement this measure with organizational age. Unique historical conditions can be a source of competitive advantage for firms (Barney, 1991). Hospitals that have been operating longer have accumulated intangible knowledge and experience gleaned from many years of operations into their culture and identity. As well, age has been identified by others as a factor that influences the type of strategy pursued by health care organizations (Beekun et al., 1998; Topping & Hernandez, 1991).

Financial resources. Financial resources enhance competitive advantage because they represent the ability and likelihood of competitive response (Bourgeois, 1981). Firms with available financial resources may experiment with new product offerings, and engage in a host of actions that would otherwise be constrained (Moses, 1992;

Schoenecker & Cooper, 1998). To measure financial resources, I use the current ratio, defined as current assets divided by current liabilities. I chose this measure because it is common to studies of both firm resources (e.g., Schoenecker & Cooper, 1998) as well as strategic groups (e.g., Fiegenbaum, Sudharshan, & Thomas, 1990; Lawless et al., 1989). I complement this measure with the debt to asset ratio, defined as total liabilities divided by total assets (cf. Nath & Sudharshan, 1994). The debt to asset ratio is an important financial measure for understanding hospital funding (Nath & Sudharshan, 1994).

Performance. Organizational performance is a construct with innumerable indicators and definitions; a broad conception of the domain of performance includes financial performance, as well as organizational effectiveness (Venkatraman & Ramanujam, 1986). To provide a rigorous test of the influences of organizational resources and strategic group characteristics on hospital performance, I incorporate indicators from each subset of organizational performance. To measure financial performance, I follow other studies that have compared firm and contextual influences on firm performance and use return on assets (ROA)(e.g., Keats & Hitt, 1988; Mauri & Michaels, 1998; Rumelt, 1991; Schmalensee, 1985). Average occupancy is used to operationalize effectiveness (cf. Nath, 1988; Nath & Sudharshan, 1994), and efficiency is captured by admissions per bed (Ketchen, Thomas, & McDaniel, 1996).

Strategic Group Measures and Clustering Procedure

The evolution of configuration analysis has produced two distinct approaches (Bantel, 1998; Ketchen et al., 1993). The inductive approach focuses on empirically derived configurations appropriate for a given context. For example, many strategic group studies have clustered firms on a variety of industry specific measures including manufacturing, marketing, financial, and industry characteristics. Because each industry

is seen as unique, the inductive approach provides no theoretical reason to expect a specific number of strategic groups in any given industry. In contrast, the deductive approach is a theory driven approach that specifies generic strategies that can be applied to a wide variety of industry contexts (Ketchen et al., 1993). Because of the overarching interest in comparing theoretical frameworks, I rely on a deductive approach for its superior generalizability.

While other deductive approaches have been used in the literature (e.g., Dess & Davis, 1984), the deductive approach used in this study relies on two theoretical perspectives at the heart of organizational analysis — strategic choice (Child, 1972; Miles & Snow, 1978) and organizational ecology (Hannan & Freeman, 1977). The basic premise of this approach is that a firm's strategy varies on two independent competitive dimensions derived from these theories (Zammuto, 1988) (see Figure 2). The first dimension relates to a firm's competitive advantage, expressed as the ability to exploit new opportunities. This may be accomplished by being first to market, or otherwise exploiting a new market quickly. The second dimension focuses on breadth of operations. This dimension includes number of distributors, geographic or product scope, and market growth/ share goals (Bantel, 1998). A strong competence in only one of these dimensions is needed for sustained competitive advantage (Zammuto, 1988).

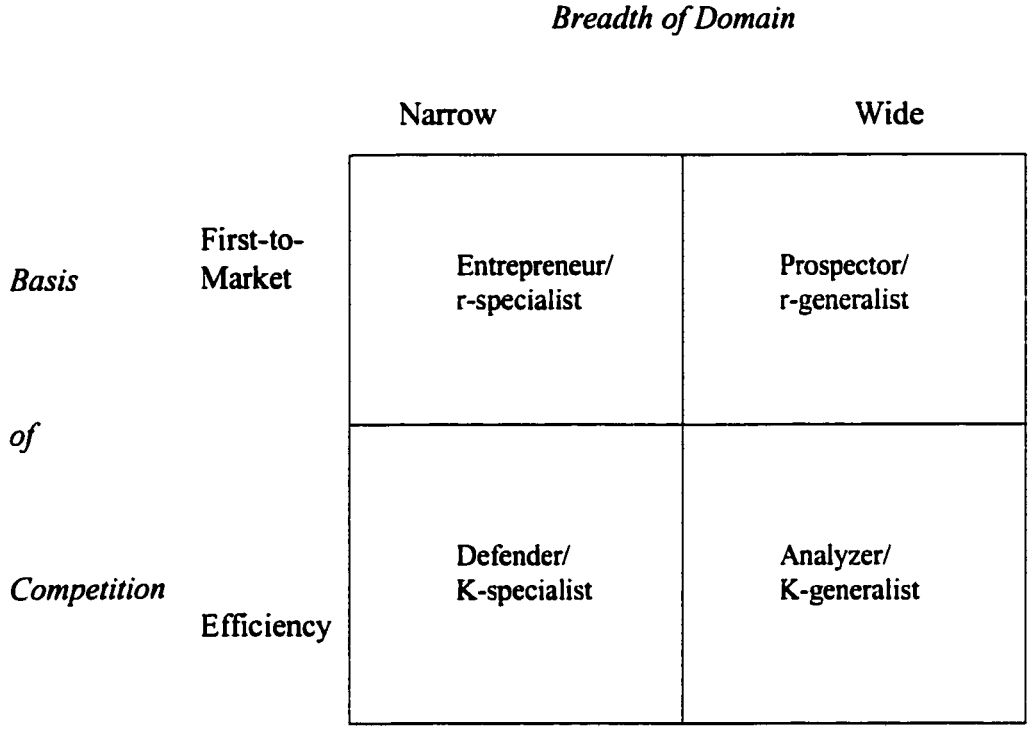

Figure 2. Strategic types combining the organizational ecology and strategic choice perspectives. Adapted from Zammuto (1988).

Combining these two dimensions results in four distinct quadrants that closely parallel the Miles and Snow (1978) typology. The first quadrant is represented by defenders/ K-specialists, who focus on existing opportunities in a narrow domain. The second quadrant encompasses entrepreneurs/ r-specialists, who pursue existing opportunities in a narrow domain. The third quadrant is comprised of Analyzers/ K-generalists, who efficiently exploit existing opportunities in a broad domain. Finally, prospectors/ r-generalists pursue new opportunities in a broad domain.

To implement this deductive approach, I used indicators from each of the two competitive dimensions: source of competitive advantage and breadth of operations (cf. Bantel, 1998; Ketchen et al., 1993). Competitive advantage in the health care industry was measured as the average percentage of routine patient days for each hospital in the study from the years 1988-1990. This was calculated as the number of total routine in-patient days divided by the total number of in-patient days (cf. Ketchen, et al., 1993). Hospitals seeking to exploit new services will have a large percentage of their patients relying on nonroutine services such as neonatal and burn care units relative to the percentage relying on routine services (e.g., radiology, pharmacy) (Ketchen et al., 1993; Shortell et al., 1990). Hospitals attempting to gain competitive advantage through nonroutine services tend to emphasize innovation (an r-strategy), whereas those with a high percentage of routine service days focus more on efficiency (a K-strategy) (cf. Ketchen et al., 1993). Breadth of operations was operationalized as the average number of services offered by each hospital during 1988–1990. Hospitals that operate with a narrow breadth of service offerings follow more of a specialist strategy, while hospitals with a broader range follow more of a generalist strategy (Ketchen et al., 1993).

A two-stage clustering procedure was used to cluster the firms in the analysis (Hair, Anderson, Tatham, & Black, 1992; Ketchen & Shook, 1996). A two-stage process is valuable because it increases the validity of cluster solutions (Ketchen & Shook, 1996; Milligan, 1980; Punj & Stewart, 1983). This procedure first uses hierarchical clustering to determine the number of groups and their cluster centroids (i.e., Ward's method) and then uses the results as the starting point for a nonhierarchical clustering (i.e., K-means). Criterion validity was assessed through MANOVA significance tests with the performance variables used in this study (Ketchen & Shook, 1996). After deriving groups, the group means for each of the variables in the cluster analysis were used as level-2 variables in the hierarchical linear modeling analysis.

Analysis

To test the influences of firm and strategic group levels of analysis I use a hierarchical linear modeling technique (Bryk & Raudenbush, 1992). Hierarchical linear modeling (HLM) allows for the treatment of multiple levels of analysis on a single dependent variable. HLM is uniquely suited to strategy research because many questions in strategic management research involve an inherently nested structure (i.e., firms are nested within strategic groups; strategic groups are nested within industries, etc.). Specifically, I used the HLM/2L statistical software program (Bryk et al., 1996) to measure organizational (i.e., level–1) and strategic group (i.e., level-2) effects on hospital performance. The technique estimates the amount of variance in organizational performance that is accounted for by each level of analysis (i.e., hospital and strategic group), as well as tests independent variables that may explain variance in performance at

each level (i.e., specific hospital resources and strategic group characteristics). Appendix A provides details of the HLM method and models tested in this study.

Results

Table 2 reports the means, standard deviations, and correlations among level-1 (i.e., individual hospital) variables. The cluster analysis results indicate three distinct groups that are depicted visually in table 3. Group 1 consists of defenders who rely on a limited number of routine services. Group 3 consists of prospectors who use a high degree of nonroutine services while operating in a large operations breadth. Group 2 consists of hospitals who balance both innovation as well as operations breadth. These firms do not clearly follow one of the strategic types proposed by Zammuto (1988). I label these hospitals as "balancers" in the post hoc analysis that follows. Results of MANOVA significance tests using firm performance measures support the validity of cluster solutions. The Wilks' Lamda, provided by the MANOVA shows significant differences in performance based on group membership ($F_{6,162} = 10.44$; $p<.001$).

The variance decomposition results for each of the performance measures used to evaluate hypothesis 1 are found in table 4. For financial performance, differences within strategic groups accounted for 98.2% of the variance in ROA. In contrast, only 1.8% of the variation was accounted for by between group differences. This 1.8% of variance was insignificant ($p = .11$). For organizational effectiveness, 89.36% of the variation in average occupancy was accounted for by within group differences while 10.64% of the variation was between groups. In terms of efficiency, 59.83% of the variation in

Table 2. Correlations Among Level-1 Independent Variables (Hospital Data)

	Mean	Standard deviation	1.	2.	3.	4.	5.	6.
1. Capital Spending	3.66	4.24	1.00					
2. Urban/ Suburban	.48	.50	.11	1.00				
3. Direct Med. Exp.	19.54	22.79	.18	.24	1.00			
4. Age	69.41	46.97	.34	.27	.18	1.00		
5. Current Ratio	2.07	1.07	.07	-.04	-.02	.22	1.00	
6. Debt-to-assets	.67	.39	.00	.25	.03	-.07	-.59	1.00

Notes: $n = 86$; Correlations above .2 are significant at the .05 level; Correlations above .3 are significant at the .01 level.

Table 3. Cluster Analysis Results (Hopital Data)

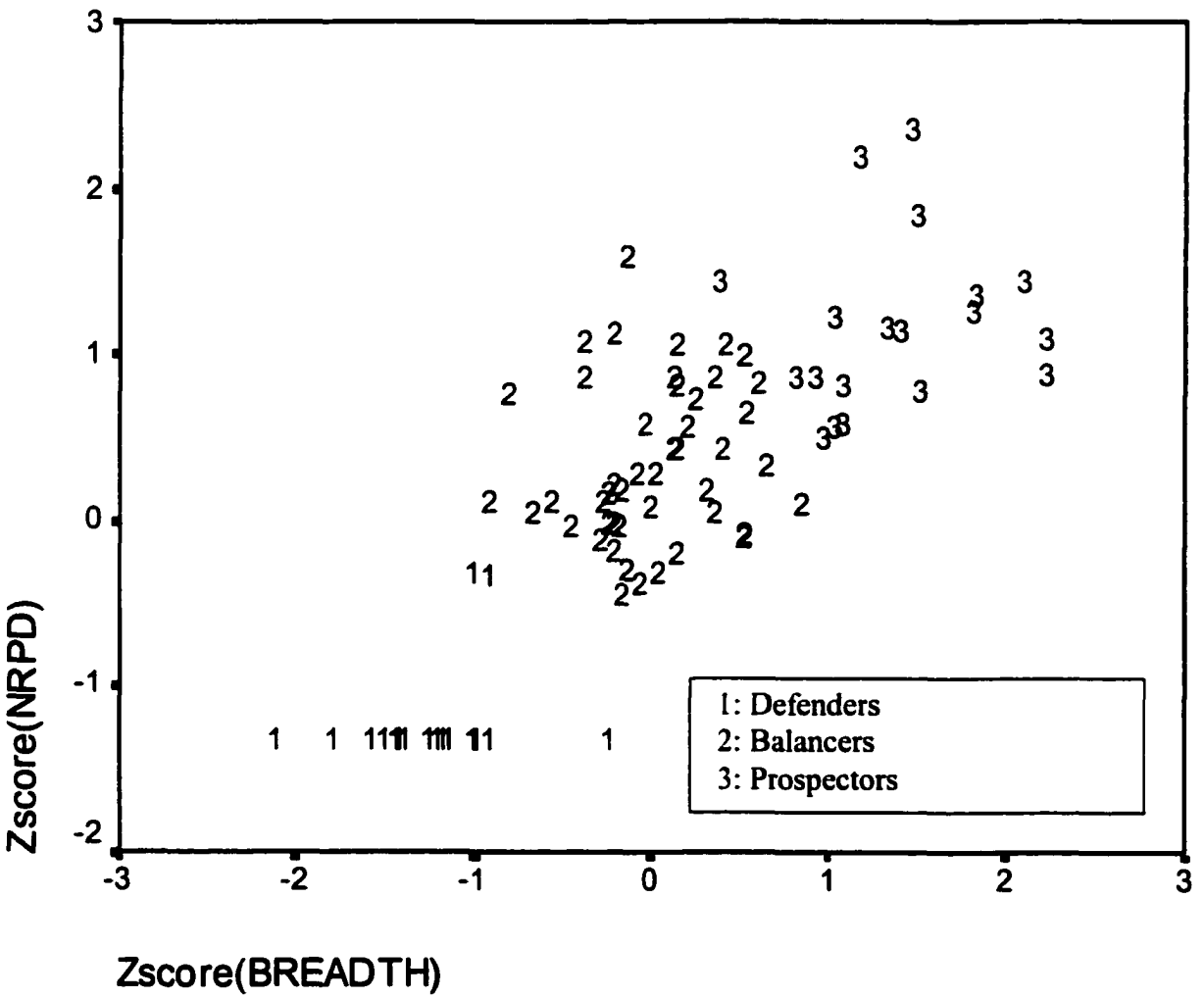

Table 4. Variance Decomposition – Hospital Data

	ROA	Occupancy	Admissions/ Bed
Level – 1 (Hospital)	98.2%	89.36%	59.83%
Level – 2 (Group)	1.8%	10.64%	40.17%
Total	*100%*	*100%*	*100%*

admissions per bed was accounted for by within group differences and 40.17% of the variation was between groups. For both nonfinancial measures, the amount of variance at each level was significant ($p<.001$). Overall, these results paint a mixed picture. Group membership had no effect on financial performance, but a significant influence on organizational effectiveness and efficiency, providing mixed evidence for hypothesis 1.

Table 5 displays the results for hypothesis 2 that predicted an influence of strategic group characteristics on performance above and beyond that felt by

Table 5. Tests of Group (i.e., main) Effects Controlling for Organizational Resources (p-values)

	ROA	Occupancy	Admissions per bed
Percentage of routine patient days (γ_{01})	1.40	.71	.89
Numbers of services (γ_{02})	1.36	.34	.10

Notes: No significant coefficients found. Hospital resources are grand mean centered while group characteristics are uncentered.

(Coefficients)

	ROA	Occupancy	Admissions per bed
Percentage of routine patient days (γ_{01})	.87	2.89	-276.39
Numbers of services (γ_{02})	.00	.01	-1.00

Notes: No significant coefficients found. Hospital resources are grand mean centered while group characteristics are uncentered.

organizational resources. The first step in this process involved testing organizational resources. These variables included physical resources (i.e., capital spending and urban/

suburban location), intangible resources (i.e., organizational age and direct medical expenses), and financial resources (i.e., current ratio and debt-to-assets ratio).

Although HLM and ordinary least squares (OLS) regressions are equivalent in terms of a level-1 model, HLM does not provide for a straightforward method for calculating the percentage of variance explained comparable to an OLS R^2. While some formulas for approximating the variance explained exist (cf. Bryk & Raudenbush, 1992), estimates from these methods are problematic (Kreft & De Leeuw, 1998). Because significance is only found for level-1 variables, I report results from OLS regression analysis for their simplicity of estimation and interpretation. These results are displayed in table 6. Overall, financial resources (i.e., current ratio and debt-to-assets ratio) significantly predicted financial performance (i.e., ROA). R^2 estimates for ROA, occupancy, and admissions per bed were .26, .09, and .12 percent respectively.

Table 6. Regression Results for Organizational Resources

	ROA		Occupancy		Admissions per Bed	
	β	t	β	t	β	t
Capital Spending	.15	1.43	.05	.65	.22†	1.93
Urban/ Suburban	-.08	-.71	.13	.27	-.20†	-1.68
Hospital Age	.06	.50	.01	.93	.06	.50
Direct Medical Expenses	-.11	-1.06	.16	.15	.15	1.36
Current Ratio	.29*	2.33	-.18	.18	.13	.99
Debt-to-Assets	-.21†	-1.70	-.27*	.05	.09	.68
df	(6,79)		(6,79)		(6,79)	
R^2	.26		.09		.12	
F	4.69**		1.37		1.77	

Notes: n=86 †p<0.1 *p<0.05 **p<0.001

Step 2 in the evaluation of hypothesis 2 utilizes HLM to explore the influence of strategic group characteristics after controlling for hospital characteristics. Results of this test indicate strategic group characteristics chosen for this study did not predict

performance irrespective of performance type (i.e., financial, effectiveness, efficiency). The results of this analysis are displayed in Table 5. Hence, while step 1 indicated that organizational characteristics do influence performance, strategic group characteristics explored in step 2 held no additional explanatory power. Hypothesis 2, therefore, was not supported.

Hypothesis 3 argued that strategic group characteristics moderate the extent to which organizational level variables influence performance. The HLM results for this analysis are displayed in table 7. Because none of the cross-level interaction terms were significance, hypothesis 3 was not supported.

In sum, results of hypothesis 1 detected variance in organizational performance both within and between strategic groups. Further, evidence used to test hypothesis 2 suggests that resources are useful in explaining a considerable amount of that variance. This finding is especially strong for financial performance (i.e., ROA). This analysis complements the variance components results that found most of the variance in financial performance exists at the organizational level. Group characteristics, however, explained no additional variance above organizational resources tested at the organizational level.

Post Hoc Analysis (Strategic Groups and Performance)

To further understandings of the effects of strategic group membership among hospitals, I conducted additional post hoc analysis to detect performance differences among strategic groups. Because of the post hoc nature of this test, the results cannot be viewed as definitive; however, this additional inquiry may be useful in identifying "possibilities" associated with group influences on performance. Also, results of this test add to the body of research that seeks to understand the influence of group membership

Table 7. Tests of Group (i.e., moderation) Effects on Organizational Resources (p-values)

	ROA	Occupancy	Admissions per bed
Percentage of routine patient days			
Capital Spending (γ_{11})	1.00	1.38	1.39
Urban/ Suburban (γ_{21})	1.21	1.24	1.08
Hospital Age (γ_{31})	1.01	1.12	1.28
Direct Medical Expenses (γ_{41})	.22	1.00	1.24
Current Ratio (γ_{51})	.16	1.14	1.13
Debt-to-Assets (γ_{61})	1.06	1.07	1.29
Numbers of services			
Capital Spending (γ_{12})	1.00	1.38	1.39
Urban/ Suburban (γ_{22})	1.27	1.38	1.08
Hospital Age (γ_{32})	1.01	1.04	1.39
Direct Medical Expenses (γ_{42})	.31	1.00	1.39
Current Ratio (γ_{52})	.18	1.27	1.27
Debt-to-Assets (γ_{62})	1.09	1.04	.80

Notes: No significant coefficients found. Hospital resources are group mean centered, while group characteristics are uncentered.

(Coefficients)

	ROA	Occupancy	Admissions per bed
Percentage of routine patient days			
Capital Spending (γ_{11})	.00	.00	-.00
Urban/ Suburban (γ_{21})	-1.98	1.53	-88.87
Hospital Age (γ_{31})	.00	.01	-2.13
Direct Medical Expenses (γ_{41})	.00	-.00	.01
Current Ratio (γ_{51})	-.01	-.68	87.89
Debt-to-Assets (γ_{61})	-.02	1.04	664.85
Numbers of services			
Capital Spending (γ_{12})	.00	.00	.00
Urban/ Suburban (γ_{22})	-.01	.01	-.46
Hospital Age (γ_{32})	.00	.00	-.01
Direct Medical Expenses (γ_{42})	.00	.00	.00
Current Ratio (γ_{52})	-.01	-.00	.33
Debt-to-Assets (γ_{62})	-.02	.01	3.00

Notes: No significant coefficients found. Hospital resources are group mean centered, while group characteristics are uncentered.

on organizational performance (Bantel, 1998; Cool & Schendel, 1987; Ketchen et al., 1993; Mascarenhas & Aaker, 1989).

The MANOVA significance test used to validate cluster solutions detected differences in performance based on group membership. Financial performance (i.e., ROA), organizational effectiveness (i.e., occupancy), and organizational efficiency (i.e., admissions per bed) were all dependent variables in this analysis. This test was therefore followed up with univariate ANOVAs in this post hoc analysis to profile differences among performance measures. The results of this analysis, as well as the means for each group along each performance measure are displayed in table 8. The univariate ANOVA tests were significant for nonfinancial performance measures. Specifically, "defenders" performed significantly better in terms of effectiveness (i.e., occupancy) while "prospectors" fared better in terms of efficiency (i.e., admissions per bed). In contrast, groups did not differ significantly for financial performance (i.e., ROA). This finding is consistent with results of hypothesis 1 that detected little variation in financial performance that is attributed to the group level of analysis.

Table 8. Post Hoc Strategic Groups Analysis (Means)

	ROA	Occupancy	Admissions per Bed
Defenders	.02	76.68	22.15
Balancers	-.01	68.58	35.36
Prospectors	.02	75.95	37.20
Univariate ANOVAs (F statistic)	2.17	6.83*	23.86**

*p<0.005 **p<0.001

Discussion

Managers face a delicate balance between positioning their organizations uniquely in their competitive environments while simultaneously maintaining awareness of competitors whose actions are worthy of imitation. The thesis of this paper has been that

both of these factors – a firm's distinct uniqueness and how a firm is positioned within a group of similarly acting competitors – are critical determinants of organizational performance. In the following sections I elaborate on how both of these areas of managerial focus are important for explaining differences in organizational performance. I then discuss limitations of this research and suggest directions for future inquiry.

Multiple Performance Influences

For two of the three performance measures, the analysis revealed significant variation in both the organizational and group levels. Hence, it appears that both organizational uniqueness and group membership can be used to explain performance differences among organizations. This finding builds upon a growing body of work in the strategy literature that has focused on examining the degree to which firm or industry "drives" performance (Brush & Bromiley, 1997; Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985). None of these studies, however, have accessed the degree to which the strategic group level of analysis influences this variance. Based on the variance in performance found in this study, it seems that previous research has been underspecified and ignored an important dimension of performance influence. Thus, our understanding of the true nature of organizational performance has been limited. Perhaps this is one reason why this body of research continues to be plagued by equivocal findings.

For organizational effectiveness (i.e., occupancy), group differences accounted for roughly ten percent of this variance. For organizational efficiency (i.e., admissions per bed), group membership explained a considerable forty percent of the performance differences. These findings support a small body of research that suggests strategic group

membership as well as organizational positioning can have an important bearing on organizational processes and outcomes, including performance (e.g., Reger & Huff, 1993). As well, these results are consistent with others who found strategic groups influence performance when the strategic group definition is based on a deductively defined framework (Bantel, 1998; Dess & Davis, 1984; Ketchen et al., 1993). However, the finding that strategic group membership is relevant for explaining nonfinancial elements of performance is in contrast to results by Nath and Sudharshan (1994). Using multiple indicators to measure financial decisions, production/ operations strategy, human resources, and business strategy they found no significant differences in occupancy across the inductively defined strategic groups in their healthcare sample.

Despite the general finding that variance in hospital performance exists at the group and organizational levels, not all the performance measures were supported. In particular, nearly all the variance in hospital financial performance (i.e., ROA) was attributed to the organizational level of analysis. One explanation for this result is that because health care providers encompass organizations with both for-profit and not-for-profit orientations, profitability measures such as ROA may be less salient performance measures for some hospital managers (Kumar, Subramanian, & Yauger, 1998). Most of the firms in this sample are in fact not-for-profit hospitals. Thus, the considerable variation in ROA may be dependent on "for-profit status" – an organizational characteristic.

Lack of Group Main and Moderating Effects

Results failed to confirm hypotheses 2 and 3 that explored the role of strategic group characteristics on organizational performance. However, several possible

explanations for these results seem plausible. First, the lack of significant group main effects while controlling for firm resources might suggests that the characteristics used to define group membership are not the same group factors that explain organizational performance. The variables used to cluster organizations in this study were based on theoretical guidance from Zammuto's (1988) typology derived from a synthesis of strategic choice and population ecology literatures. However, future research may benefit by exploring factors that are unique to each group, such as bargaining power over buyers and suppliers. Such factors may provide mobility barriers that enhance performance beyond organizational resources. Thus, future research should explore the role of strategic group variables other than those used to define group membership.

Results in this study did not support the hypothesis that group characteristics moderated the relationships between firm resources and performance. If group characteristics do not moderate the relationships between resources and performance, it seems that in this sample, resource value is better understood in terms of an organization's unique positioning of resources within the industry, irregardless of differences from the group. Thus, future research might benefit from an examination of how industry characteristics may moderate the relationship between firm resources and performance.

The lack of significance for the group measures should by no means be interpreted as a lack of support for the importance of group membership. Clearly, the variance components analysis as well as post hoc analysis suggests that some of organizational performance is a function of groups. The typology used in this study, however, may warrant further scrutiny in this unique industry context. While Zammuto's

(1988) original classification scheme proposed four distinct types of firms, I detected evidence for only three groups in this industry. Of the three, only two clearly followed the strategies indicated by the juxtaposition of strategic choice and population ecology espoused by Zammuto (1988). While this finding casts doubt on the veracity of certain specifics provided by the typology, results were nonetheless informative. Evidence from post hoc tests provided evidence that hospital performance may depend on consistent commitment to a clear strategy. Indeed, the hospitals that committed to either defender or prospector strategies outperformed the balancer group in this sample. This supports Zammuto's (1988) more general assertion that to be successful organizations need to focus on innovation or efficiency, but not both.

Future research should continue to explore alternative definitions of the strategic group construct. Perhaps researchers in strategic groups have been too specific in their approach to grouping firms. Indeed, much criticism has been levied against inductive approaches that focus on rich contextual understandings to the detriment of more generalizable insights (e.g., Ketchen et al., 1993). While the classification scheme used in this study sought to ameliorate this problem by simplifying the industry into four distinct groups, perhaps the typology did not go far enough in its simplification efforts. A return to an ever more basic categorization such as innovation versus efficiency would serve to tie the strategic groups literature back to more traditional classification schemes such as Burns and Stalker's (1961) typology of mechanistic and organic systems. Future research should explore these as well as other classification schemes that may provide insights across multiple industry contexts.

The Importance of Organizational Resources

To further understanding of resource-based influences on performance, Rouse and Daellenbach (1999) proposed a systematic process where researchers sample from a single industry, group firms based on a group typology, and profile performance differences within and between groups. This study draws from their suggestions to provide for a sophisticated test of their procedure, and allow for rich understandings of the efficacy of firm resource holdings. Substantial variance in hospital performance was explained by testing organizational resource variables. More than 25% of the variance in financial performance (i.e., ROA) was explained by the organizational resources measured in this study. Thus, while group variables did not explain variance in hospital performance in the HLM results, the firm resource variables (i.e., current ratio and debt-to-assets) explained substantial performance variation using OLS regression. The RBV is often criticized because its tenets are a challenge to operationalize (Yeoh & Roth, 1999). This study is one of a few empirical attempts to investigate the RBV. By doing so, it advances knowledge of resource holdings in an important industry context.

Our understanding of organizational performance may be aided by profiling the types of resources that affected various performance measures. Financial resource measures were significant for financial performance (i.e., ROA). Specifically, hospitals with high liquidity (i.e. current ratio) and low debt-to-assets outperformed other hospitals. This finding has implications for researchers of organizational slack. The direct influence of slack resources on performance has been unclear in the literature (Cyert & March, 1963), with some arguing that slack allows for innovative actions that lead to performance (Bourgeois, 1981; Singh, 1986) while others asserting a negative

relationship between slack resources and performance because slack is essentially "waste" (Antle & Fellingham, 1990). Results of this study are consistent with those of Bromiley (1991) who found a positive relationship between slack and performance (as measured by current ratio and debt-to-equity). In the changing hospital environment investigated in this study, accruing slack resources seems critical to achieving superior financial performance.

Finally, results of this study suggest that the effect of resources is dependent on the type of performance being considered. Thus, managers must carefully monitor and accumulate resources needed to achieve their specific performance goals. For example, financial resources significantly predicted financial performance (i.e., ROA), but did not significantly effect nonfinancial measures (i.e., occupancy and admissions per bed). Empirical evidence supports the notion that the efficacy of certain resources may be context specific and vary across industry settings (Schoenecker & Cooper, 1998). Empirical evidence from this study demonstrates a more puzzling relationship – the value of certain resources also varies based on performance measure. This may be problematic for organizational functioning because mangers may become extremely efficient in achieving the wrong performance goals. Thus, an extention of this research could focus on how the salience of certain performance measures over others alters manager's decisions to accumulate certain types of resources and how those decisions affect subsequent performance.

Limitations and Directions for Future Research

Several limitations specific to this study should be noted. First, the decision to control for industry limits the generalizability of study results. Thus, future research

should examine organizational, group, as well as industry influences on performance. A steady stream of research has examined firm and industry influences on firm performance, and to date has received equivocal results. By including the strategic group level of analysis, future research can develop a more realistic model of multiple firm performance influences.

Future research should also incorporate additional measures at the group level of analysis that may be critical for predicting variance in performance. I chose to rely on the variables used to define clusters as the measures that may explain organizational performance beyond organizational resources. Other group level variables, however, may be more useful towards explaining organizational performance. Researchers should encourage the discovery and use of such measures. For example, measures of mobility barriers or group bargaining ability might be included in future research efforts.

Conclusion

Understanding the determinants of organizational performance remains one of the central goals of the strategy field. Combining elements of the RBV and SGR suggests that both views aids in this endeavor. This study is the first to explore how much variance in organizational performance organizational and group levels of analysis explain. One particular finding of interest is that the amount of variance at each level differs based on performance measure. Overall, findings from this study encourage researchers to look at multiple levels of analysis using multiple performance measures to provide a more comprehensive, albeit complex, understanding of multiple influences on organizational performance.

A MULTILEVEL EXAMINATION OF RESOURCE-BASED, STRATEGIC GROUP, AND INDUSTRY INFLUENCES ON FIRM PERFORMANCE

Understanding the determinants of firm performance has been a central interest of strategy researchers since the origin of the field in the 1960s (Rumelt et al., 1994). Strategy researchers have traditionally approached this research question in a more holistic approach than other disciplines — incorporating insights from psychology, economics, finance, marketing, and administrative management (Jemison, 1981a, 1981b; Rumelt et al., 1994; Summer et al., 1990). Indeed, one "distinctive competence" of strategic management research is the blending of multiple theoretical perspectives to aid in answering interesting and practical research questions such as the determinants of firm performance (Meyer, 1991). The incorporation of multiple theoretical approaches can provide the basis for rich descriptions of organizational antecedents, actions, and outcomes (Combs & Ketchen, 1999).

Efforts to study the determinants of firm performance have generally focused on three influential levels of analysis: firm, industry, and strategic group (McGee & Thomas, 1986). Researchers following the resource-based view of the firm (Barney, 1991; Wernerfelt, 1984) argue that the heterogeneity of firm resources is an important strategic factor that can differentially influence firm performance. Thus, performance differences emanate from firm resource differences. Strategic groups research has argued that firms following similar strategies may benefit from group characteristics that enable them to generate superior performance compared to others in the same industry (e.g., Dranove et al., 1998; Porter, 1979; Reger & Huff, 1993). Under this view, analysis of groups of firms within the same industry can be beneficial. Drawing on considerable economic research (e.g., Bain, 1956, 1959; Mason, 1939), researchers in strategic management also

agree that industry membership wields considerable influence on firm performance (Keats & Hitt, 1988; McGahan & Porter, 1997; Porter, 1980; Rumelt, 1991).

When used in isolation, each of these views provides a partial explanation of why firms differ in terms of performance. Within a given study, however, the exclusion of key influences leads to a host of theoretical and empirical problems. Conceptually, overlooking one or more views detracts from our understanding of which level of influence is more important in determining firm performance — an issue some have argued is at the very heart of the field (Keats & Hitt, 1988). Methodologically, studies focusing on only one level of analysis limit the interpretability of previous research. For example, if groups and industries influence performance, studies conducted at the individual firm level of analysis have violated the independence of observations assumption that underlies traditional statistical techniques (Bryk & Raudenbush, 1992; Hofmann, 1997). As well, if industry matters, studies focusing only on strategic group explanations are also subject to this criticism. One the other hand, studies that focus solely on higher levels, such as industries or strategic groups may be criticized because they overlook potentially meaningful lower level variance that exists among firms. A better understanding of the "true" nature of firm performance could by gained if researchers heeded calls to incorporate multiple levels of analysis (Henderson & Mitchell, 1997; Mahoney & Pandian, 1992; Rouse & Daellenbach, 1999).

I take the position that understanding the relative influences of multiple levels of analysis can be advanced by examining firm, strategic group, *and* industry influences on firm performance simultaneously. Such an analysis is needed to enhance our understanding of strategic group relationships in tandem with firm and industry effects

(Cool & Schendel, 1988; Dranove et al., 1998; Mehra, 1996). As well, this approach provides a broader picture of the multiple influences on firm performance. Examining multilevel influences on firm performance in a single model will shed light on two basic research questions. First, I will determine how much variance in firm performance is explained by each level of analysis (i.e., firm, strategic group, industry), providing evidence for which level "matters" the most (cf. Rumelt, 1991). Second, I will test the extent to which key variables at each level of analysis are responsible for explaining variance in firm performance. By taking this approach, I hope to provide insights concerning *which* level of analysis is more important, as well as specifics about *how* and *why* variables at each level of analysis influence performance.

Literature Review

Multilevel Influences on Performance

The merits of incorporating multiple levels of analysis have been hailed by numerous scholars in the field of management in general (Hofmann, 1997; House, Rousseau, & Thomas-Hunt, 1995; Klein, Dansereau, & Hall, 1994; Klein, Tosi, & Cannella, 1999; Morgeson & Hofmann, 1999) and strategy in particular (Dranove et al., 1998; Henderson & Mitchell, 1997; Rouse & Daellenbach, 1999). Investigations about level of analysis effects on firm performance represent an important exchange of ideas in strategic management research. Indeed, a rich history in the strategy literature has tested the disparate influences of firm and industry effects to determine which level of analysis is more important for understanding firm performance (Brush & Bromiley, 1997; Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985).

While firm and industry characteristics represent two driving forces behind firm performance (Mauri & Michaels, 1998), some strategy researchers have argued that another level of analysis — the strategic group — is also worthy of investigation (Hunt, 1972; Porter, 1979). Strategic groups are intraindustry groups of firms making similar decisions in key areas (Porter, 1980; Reger & Huff, 1993). Numerous group traits such as shared identity (Peteraf & Shanley, 1997), strategy (Dess & Davis, 1984), bargaining power (Dranove et al., 1998) and mobility barriers (Mascarenhas & Aaker, 1989; Porter, 1979) can influence managers' interpretations and actions. Despite numerous studies that have found a relationship between group membership and performance (e.g., Dess & Davis, 1984; Fiegenbaum & Thomas, 1990; Mehra, 1996; Nath & Gruca, 1997; Reger & Huff, 1993), integration of the strategic group construct into investigations of firm and industry influences on performance has been scant (Mahoney & Pandian, 1992; Rouse & Daelenbach, 1999). While a handful of studies have acknowledged firm differences exist within strategic groups (e.g., Cool & Shendel, 1988; Lawless et al., 1989; Reger & Huff, 1993), no study to date has simultaneously measured firm, strategic group, and industry influences on firm performance. Given that there is a wealth of conceptual evidence that firm differences as well as strategic group and industry membership play a role in determining firm performance differences (Dranove et al, 1998), I hypothesize the following,

Hypothesis 1: Firms, strategic groups, and industries explain unique components of the variance in firm performance.

Strategic Group Characteristics Influence Performance

While understanding the extent to which firms, strategic groups, and industries explain variation in firm performance can provide a valuable contribution to the literature, further insights can be gained by understanding *how* variables at each level of analysis influence performance. Of specific interest is the influence of strategic group membership on performance. Strategic groups researchers have implicitly argued for a direct link between group membership and performance. Group membership in and of itself, however, is not directly responsible for differentiating groups in terms of performance. Instead, it is likely that persistent structural features such as mobility barriers in certain key areas make group membership more attractive in some groups over others (Caves & Porter, 1977; Dranove et al., 1998; Mehra, 1996). Other specific group traits might include group bargaining ability (Dranove et al., 1998), or a strong group reputation or image (Peteraf & Shanley, 1997). Thus, the advantage of group membership is a function of specific characteristics that define the group. These characteristics have been labeled as strategic industry factors, or resources that are valuable within an industry (as opposed to idiosyncratic resources) (Amit & Schoemaker, 1993; Mehra, 1996).

Our understanding of firm performance can be improved by testing strategic group characteristics that may influence performance. Traditionally, this has been accomplished by a two stage process where firms are first clustered into groups based on hypothesized characteristics and those groups are tested for performance differences. Some researchers, however, have criticized results of this strategy as being theoretically bankrupt (Barney & Hoskisson, 1990). Consequently, some have argued that future

research in the strategic groups literature should offer a more rigorous test of the effects of strategic group characteristics on firm performance that first controls for the effects of firm resources (Dranove et al., 1998). The most straightforward test under this paradigm would measure the influence of distinctively group characteristics while holding the influence of firm resources constant. Thus,

Hypothesis 2: Strategic group characteristics have a direct (i.e., main) effect on firm performance beyond that accounted for by firm resources.

Group membership may also have an indirect affect on firm performance by changing the nature of the relationship between firm resources and performance within a group. The idea that certain resources are more critical in some strategic groups than in others is consistent with Porter's (1980) view that firm's will be positioned within their strategic groups based on "structural" differences. While all firms within a strategic group may receive some benefit from group membership, resource heterogeneity may influence within group performance differences (Cool & Schendel, 1988). Indeed, Reger and Huff (1993) found that firms closely representing the group's "core" defining traits outperformed firms following the group recipe less consistently. This notion is backed by considerable theoretical and empirical evidence stemming from the resource-based view that differences in firm resources and assets are critical determinants of firm performance differences (e.g., Amit & Schoemaker, 1993; Barney, 1991; Dierickx & Cool, 1989; Lawless et al., 1989; Mahoney & Pandian, 1992; Wernerfelt, 1984).

Despite conceptual and empirical evidence that both firm resources as well as group characteristics influence firm performance, little guidance has been given about the form of the relationship between resources, strategic group membership, and performance. I take the position that strategic group membership moderates the

relationship between firm resources and performance. That is, characteristics of the group alter the efficacy of firm resources to enhance performance. For example, firms overcoming substantial mobility barriers in marketing and R&D to position themselves into a group will likely find it more difficult to differentiate their firms on these characteristics within the group. Stated formally,

Hypothesis 3: Strategic group characteristics moderate the relationship between firm resources and performance.

Industry Influences on Performance

Contextual differences stemming from industry effects have also played a key role in strategic management investigations of firm performance (Dess, Ireland, & Hitt, 1990; Hamel & Prahalad, 1994; Wiersema & Bantel, 1993). Industry characteristics can influence strategic perspectives (Sutcliffe & Huber, 1998), actions (Slevin & Covin, 1997) and outcomes (Dess et al., 1990; Li & Simerly, 1998). Industry conditions may make certain types of strategic groups more likely to achieve superior performance. Most strategic groups researchers, however, have explicitly controlled for contextual industry influences by investigating groups through rich analysis of a single industry setting (e.g., Houthoofd & Heene, 1997; Lewis & Thomas, 1990; Mascarenhas & Aaker, 1989; Mehra, 1996).

While most empirical research on strategic groups has sidestepped the influence of industry characteristics on performance, Ketchen, Thomas, & Snow (1993) provided some general ideas about how industry conditions may favor one strategic group over another. Specifically, they argued that in environments characterized by low munificence, "specialist" groups focusing on narrow product offering will outperform "generalists" that operate in a broad domain. As well, they assert that in dynamic

environments, firms focusing on capitalizing on new opportunities will outperform firms who focus on exploiting existing opportunities. While they found some support for their assertions, their use of a single industry did not allow for examination of the effects of variance in munificence and dynamism in a multi-industry setting. Thus, while evidence has raised the possibility that industry characteristics may influence strategic group membership on performance, a true moderated relation has not been tested empirically. Because little theoretical guidance suggests how industry characteristics influence strategic group performance, I propose the following hypothesis in its most general form,

Hypothesis 4: Industry characteristics moderate the influence of strategic group characteristics on firm performance.

Method

Sample

I drew my sample from the COMPUSTAT database. Compiled by Standard & Poor's, COMPUSTAT includes accounting and financial data on over 7,000 companies in more than 300 industries. COMPUSTAT has been a well established database in strategic management because researchers gathering data from COMPUSTAT can be assured that data are comparable across companies and industries (Davis & Duhaime, 1992; Stimpert & Duhaime, 1997a). Because of the interest in examining multilevel influences on firm performance, I restrict my sample to firms that operate in a single business segment to eliminate statistical noise that would occur if I attempted to measure diversified firms operating in multiple industries (cf. Mauri & Michaels, 1998). Also, the use of nondiversified firms eliminates any confounding that would occur if diversified firms were placed into strategic groups.

A lagged structure was employed to improve the ability to make causal inferences about multilevel influences on firm performance (cf. Palmer & Wiseman, 1999). Firm resources, strategic group traits, and industry characteristics were measured with data taken from the years 1991-1995, and firm performance variables were averaged from the years 1993-1997. The decision to use five years for firm resources, group traits, and industry characteristics was driven by the need to have data for the standard five-year time frame used to analyze industry characteristics (cf. Keats & Hitt, 1988; Weinzimmer et al., 1998) as well as to provide a stable basis for comparing competitive strategies (cf. Miles et al., 1993). Five years of performance data are also necessary to provide a stable measure of firm performance (cf. Bierly & Chakrabarti, 1996; Keats & Hitt, 1988). Three years of data overlap were chosen because some resources may have immediate effects on firm performance, while others may take a number of years before their performance affects are fully realized (cf. Palmer & Wiseman, 1999). The years 1991-1997 were selected because they were the most recent available from COMPUSTAT.

The sample was drawn from several manufacturing industries to enhance generalizabilty about firm, strategic group, and industry influences on firm performance. In addition to the single business requirement, the sample was further restricted to industries with a minimum of 45 firms to have the statistical power needed to detect a medium strategic group effect (Ferguson & Ketchen, 1999). This requirement also avoids biasing the sample to only find firm effects. Specifically, I sample from twelve four-digit SIC industries where competition is dominated by single business firms. Industries consisting primarily of undiversified firms tend to be less mature, younger, and relatively unconsolidated. The specific industries sampled include pharmaceutical

preparations (SIC = 2834), in vitro/ vivo diagnostics (SIC = 2835), biological products (SIC = 2836), special industry machinery (SIC = 3559), computer communication equipment (SIC = 3576), computer periphery equipment (SIC = 3577), television and telegraph apparatus (SIC = 3661), radio, television broadcasting, and communication equipment (SIC = 3663), semiconductor related devices (SIC = 3674), surgical, medical equipment and apparatus (SIC = 3841), electromedical apparatus (SIC = 3845), and prepackaged software (SIC = 7372), bringing the total analysis sample to 1,163 firms.

Firm Resource Measures

A number of firm resource categorizations have been presented in the literature (Black & Boal, 1994). I rely on the classification of Chatterjee and Wernerfelt (1991), which places firm resources into three categories: physical, intangible, and financial. This classification is well grounded in the literature (e.g., MacDonald, 1984; Montgommery & Hariharan, 1990; Teece, 1982) and remains a popular resource classification framework (e.g., Schoenecker & Cooper, 1998). To operationalize firm resources, I selected multiple measures from each of these categories. As well, I selected measures with the requirement that they are useful in representing firm resources, yet are not idiosyncratic to any one industry (cf. Miles et al., 1993).

Physical resources. Physical resources encompass the firm's physical technology, plant and equipment, geographic location, and access to raw materials (Barney, 1991). I use two indicators to measure physical resources. First, I use capital intensity, defined as capital expenditures divided by sales. A firm that makes a consistent commitment to capital expenditures is continually building their property, plant and equipment. As well, capital investment is a measure of business strategy that has been

shown to have a strong relationship with firm performance across studies (e.g., Capon, Farley, & Hoenig, 1990; Stimpert & Duhaime, 1997a). To capture geographic location I use the percentage of domestic sales divided by total sales. A company with a high percentage of domestic sales is less likely to have global operations, and more likely to focus on domestic customers and suppliers of raw materials.

Intangible resources. To conduct a thorough operationalization of intangible resources, I include both purchasable and nonpurchasable intangible resources in my analysis. First, I use the number of patents granted to the firm between 1991 and 1995, available from the CASSIS database from the Patent and Trademark Office of the U.S. Department of Commerce (Penner-Hahn, 1998). Because patent protection provides the owner with exclusive rights to make, use and sell the patented invention for more than a decade, a patent is an intangible resource that can be used by firms to achieve a sustained competitive advantage (Hall, 1992, 1993).

While patents and other technology resources can be purchased in the open market, a company's reputation is an intangible resource which can not be bought or sold, and usually has to be earned over a long period of time (Hall, 1992). A corporation's reputation consists of a set of attributes inferred from the firm's past actions and ascribed to the firm (Weigelt & Camerer, 1988). To operationalize reputation I use ratings available from Standard & Poor's (Fombrum, 1996). As one of the top three ratings agencies, reputation measures derived from ratings agencies like Standard & Poor's are appropriate for judging general perceptions of company reputation, and are especially helpful for rating performance potential (Fombrum, 1996). Such ratings are based on a long-term perspective that extends beyond a brief earnings periods (Fombrum, 1996).

Reputational measures from financial ratings agencies are appropriate for judging reputation due to their access to information such as minutes of board meetings, profit breakdowns by product, and new product plans (Ederington & Goh, 1998; Ederington & Yawitz, 1987). While few ratings are available that are meaningful for multiple industries, Standard and Poor's ratings available on COMPUSTAT provide a yearly average of multiple analyst's projections concerning the firms potential earnings (i.e., earnings per share). I measure reputation as the average qualified opinion from 1991 to 1995.

Financial resources. Liquidity ratios are commonly used to identify a firm's availability of financial resources (Chatterjee & Wernerfelt, 1991; Palepu, 1986). Available financial resources provide the means for achieving strategic flexibility that can enhance organizational performance (Greenley & Oktemgil, 1998). Following Chatterjee and Wernerfelt (1991), I use the current ratio to measure financial resources. The current ratio is calculated by dividing current assets by current liabilities and represents a firm's liquidity, or the ability to pay bills and other immediate debts. A second measure of financial resources used in this study is leverage. In particular, I measure the debt-to-equity ratio, which indicates the potential to generate financial resources in the future (Bromiley, 1991).

Performance

Firm performance is a concept with a substantial number of possible indicators (Venkatraman & Ramanujam, 1986). Hence, several distinct measures will be used here to operationalize the multifaceted nature of firm performance (i.e., accounting-based and market-based). First, I will use return on assets (ROA) because this measure has been

used as an indicator of performance in several multilevel studies of firm performance (e.g., Brush et al., 1999; Keats & Hitt, 1988; Mauri & Michaels, 1998; Rumelt, 1991), and has often been the sole measure of firm performance in many of these studies (e.g., Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Rumelt, 1991; Schmalensee, 1985). I supplement this accounting-based measure with return on investment (ROI), and return on equity (ROE). I measure market-based performance with the price-earnings ratio (PE)(cf. Lewis & Thomas, 1990; Mehra, 1996). Finally, Altman's Z is a measure of bankruptcy propensity, and is useful for understanding firm survival (Altman, Avery, Eisenbeis, & Sinkey, 1981).

Strategic Group Measures and Clustering Procedure

The evolution of configuration analysis has produced two distinct approaches (Bantel, 1998; Ketchen et al., 1993). The inductive approach focuses on empirically derived configurations appropriate for a given context. In contrast, the deductive approach is a theory driven approach that can be applied to a wide variety of industry contexts (Ketchen et al., 1993). Because my interest is examining multiple strategic groups within a number of industries, I rely on the deductive approach for its superior generalizability.

While other deductive approaches have been used in the literature (e.g., Dess & Davis, 1984), the deductive approach used here relies on two theoretical perspectives at the heart of organizational analysis — strategic choice (Child, 1972; Miles & Snow, 1978) and organizational ecology (Hannan & Freeman, 1977). The basic premise of this approach is that a firm's strategy varies on two independent competitive dimensions derived from these theories (Zammuto, 1988). The first dimension relates to a firm's competitive advantage, expressed at the ability to exploit new opportunities. This may be

accomplished by being first to market, or otherwise exploiting a new market quickly. The second dimension focuses on breadth of operations. This dimension includes number of distributors, geographic or product scope, and market growth/ share goals (Bantel, 1998). A strong competence in only one of these dimensions is needed for sustained competitive advantage.

Combining these two dimensions results in four distinct quadrants that closely parallel the Miles and Snow (1978) typology. The first quadrant is represented by defenders/ K-specialists, who focus on existing opportunities in a narrow domain. The second quadrant encompasses entrepreneurs/ r-specialists, who pursue existing opportunities in a narrow domain. Analyzers/ K-generalists, efficiently exploit existing opportunities in a broad domain. Finally, prospectors/ r-generalists, pursue new opportunities in a broad domain.

I use two measures to cluster strategic groups along each of the competitive dimensions developed by Zammuto (1988). To measure competitive advantage, I use R&D intensity (cf. Bantel, 1998). A firm that makes a significant, consistent investment to R&D has the capability to create an innovation or be an early follower (Schoenecker & Cooper, 1998). I measure R&D intensity as the average R&D expenditure divided by sales for the years 1991-1995 (Bierly & Chakrabarti, 1996). To measure breadth of operations, I use the number of trademarks the firm holds. Trademarks proxy for operations breadth because firms with a large number of trademarks are likely to be involved in the production of numerous products, services, or devices (Cohen, 1986, 1991; Hall, 1992). Conversely, firms that hold few trademarks are more likely to focus

their operations on a narrow niche market. Thus, trademarks capture a number of unobservables associated with competitive scope.

A two-stage clustering procedure was used to cluster the firms in the analysis (Hair, Anderson, Tatham, & Black, 1992; Ketchen & Shook, 1996). A two-stage process is valuable because it increases the validity of cluster solutions (Ketchen & Shook, 1996; Milligan, 1980; Punj & Stewart, 1983). This procedure first uses hierarchical clustering to determine the number of groups and their cluster centroids (i.e., Ward's method) and then uses the results as the starting point for a nonhierarchical clustering (i.e., K-means). Criterion validity was assessed through MANOVA significance tests with the performance variables used in this study (Ketchen & Shook, 1996). After deriving groups, the group means for each of the variables in the cluster analysis were used as level-2 variables in the hierarchical linear modeling analysis, described later.

Industry Measures

Adequate measures for industry effects have been absent from much of the strategy literature (Dess et al., 1990). To provide a complete picture of the industry level of analysis I followed two procedures. First, I stratified the sample by industry to ensure that samples coincide with the variables and relationships examined in the study (Harrigan, 1983). Second, I used the environmental dimensions of munificence, dynamism, and complexity developed by Dess and Beard (1984). These measures provide continuous estimates of several environmental dimensions that a number of researchers in the field agree capture multiple environmental dimensions in a parsimonious fashion (Dess et al., 1990; Keats & Hitt, 1988). As well, these measures have been used in previous studies of multilevel influences on firm performance (e.g.,

Keats & Hitt, 1988; Lawless & Finch, 1989; Palmer & Wiseman, 1999; Sharfman & Dean, 1991; Weinzimmer et al., 1998).

Industry munificence, or environmental growth, was calculated by regressing five years of industry sales data over time. The corresponding standardized coefficient (i.e., β) was used as the measure of growth for each industry in the sample (cf. Boyd, 1995; Dess & Beard, 1984; Keats & Hitt, 1988; Weinzimmer et al., 1998; Wiersema & Bantel, 1993). Dynamism, or industry volatility, was operationalized as the standard error of the regression coefficient for the munificence equation previously described (cf. Dess & Beard, 1984; Keats & Hitt, 1988). The concept of environmental complexity has been described in many ways (Dess & Beard, 1984; Keats & Hitt, 1988; Porter, 1980), although complexity has most commonly been operationalized as industry concentration (e.g., Boyd, 1995; Keats & Hitt, 1988; Palmer & Wiseman, 1999). Highly concentrated industries have few competitors, are fairly predictable and are low in complexity. In contrast, industries marked by low concentration have many competitors, with considerable activity that is difficult to monitor. Thus, I operationalize industry complexity as the five-year average of each industry's four-firm concentration ratio (cf. Eisenhardt & Schoonhoven, 1990; Pennings, 1981; Romanelli, 1989).

Hiearchical Linear Modeling Analysis

To model the effects of multiple variables at each level of analysis I use a three level hierarchical linear modeling technique to conduct the statistical analysis (cf. Bryk & Raudenbush, 1988, 1992; Duncan, Jones, & Moon, 1996; Raudenbush, Rowan, & Cheong, 1993; Raudenbush, Rowan, & Kang, 1991). Specifically, I use the HLM/3L software package (Bryk et al., 1996). The use of hierarchical linear modeling provides

for improved estimation of fixed effects, while simultaneously allowing for the partitioning of variance-covariance components (Bryk & Raudenbush, 1992). While variance components models have been used in a number of strategic management studies (e.g., Balakrishnan & Fox, 1993; Mauri & Michaels, 1998; Rumelt, 1991; Schmalensee, 1985), the HLM software package is advantageous because in addition to estimating the variance that resides at each level, these models also allow for the prediction of variance using multiple independent variables at each level of analysis (Bryk & Raudenbush, 1992). Thus, this methodology is able to assess *how* important each level is in explaining performance, as well as provide insights as to *why* each level is important. Although hierarchical linear modeling techniques have recently appeared in the management literature (e.g., Deadrick, Bennett, & Russell, 1997; Hofmann, 1997; Hofmann & Stetzer, 1998; Kidwell et al., 1997), these techniques have yet to be utilized in strategic management research. Details of the HLM method and its associated tests are provided in Appendix B.

Results

Table 9 reports the means, standard deviations, and correlations among level-1 (i.e., individual firm) variables. Table 10 reports the means, standard deviations and correlations among level-3 (i.e., industry) variables. Table 11 presents the descriptive statistics for dependent variables at the firm level of analysis. Only two variables were measured at the group level of analysis. The correlation of -.23 between these variables measured at level-2 (i.e., R&D Intensity and trademarks at the group level of analysis) was insignificant ($p = .11$).

Table 9. Correlations Among Level-1 Independent Variables (COMPUSTAT Data)

	Mean	Standard deviation	1.	2.	3.	4.	5.	6.
1. Capital Intensity	1.77	6.79	1.00					
2. % Foreign Sales	10.27	19.69	.01	1.00				
3. Patents	2.56	5.89	-.04	.03	1.00			
4. Reputation	.27	.78	-.07	.21	.08	1.00		
5. Current Ratio	3.84	3.15	.09	-.14	.13	-.28	1.00	
6. Debt-to-Equity	13.82	44.46	-.01	.04	.01	.11	-.07	1.00

Notes: n = 1,163 Correlations above .05 are significant at the .05 level. Correlations above .07 are significant at the .01 level

Table 10. Correlations Among Level-3 Independent Variables (COMPUSTAT Data)

	Mean	Standard Deviation	1.	2.	3.
1. Munificence	.91	.24	1.00		
2. Dynamism	1.06	.05	-.04	1.00	
3. Complexity	.69	.18	-.27	.13	1.00

n = 12

Table 11. Correlations Among Level-1 Dependent Variables (COMPUSTAT Data)

	Mean	Standard Deviation	1.	2.	3.	4.	5.
1. ROA	-16.14	31.77	1.00				
2. ROI	-18.54	51.25	.57	1.00			
3. ROE	-10.41	52.35	.39	.56	1.00		
4. PE	4.59	22.61	.29	.19	.16	1.00	
5. Altman's Z	6.83	8.71	.15	.04	-.03	.01	1.00

Correlations above .1 are significant at the .01 level

Four strategic groups were detected in each industry. Results of MANOVA significance tests using firm performance measures support the validity of cluster solutions. The F tests from Wilks' Lamda, provided by the MANOVA show highly significant differences in performance based on group membership for all industries in the sample ($p<.001$).

The variance decomposition results for each of the performance measures used to evaluate hypothesis 1 are found in table 12. For financial performance, ROA, ROI, and ROE were measured. For ROA, 65.82% of the variance was accounted for by differences within strategic groups, 14.95% of the variance was between strategic groups, and 19.23% of the variance was between industries. Using ROI, differences within strategic groups accounted for 86.53% of variance while differences among groups and industries accounted for 3.4% and 10.07%, respectively. For ROE, 90.57% of the variance was accounted for by differences within strategic groups, .24% of the variance was between strategic groups, and 9.19% of the variance was between industries.

Table 12. Decomposition of Variance – COMPUSTAT Data (No Predictors Specified)

	ROA	ROI	ROE	PE	Altman's Z
Level – 1 (Firm)	65.82	86.53	90.57	95.74	96.08
Level – 2 (Group)	14.95	3.40	.24	1.85	2.59
Level – 3 (Industry)	19.23	10.07	9.19	2.41	1.33
Total	100%	100%	100%	100%	100%

The other types of performance considered in this dissertation were market performance and survival. For market performance, 95.74 percent of the variance in PE was within strategic groups, 1.85% of the variance in firm performance was between groups, and 2.41% of the variance was between industries. Considering firm survival, 96.08% of the variance in Altman's Z was within groups, while 2.59% of the variance in this measure was between groups and 1.33% of the variance was between industries. Overall, variance in firm performance was detected at each level of firm performance (i.e., firm, strategic group, industry) across all performance measures. Even the .24% of

variance in ROE at the group level of analysis was significant ($p < .05$), providing strong support for hypothesis 1.

Hypothesis 2 argued that strategic group characteristics would influence firm performance above and beyond the influence of firm resource variables. Results for the tests of this hypothesis are presented in table 13. For ROA, both group R&D Intensity (i.e., source of competitive advantage) and trademarks (i.e., breadth of operations) significantly predicted performance above and beyond firm resources ($t = -5.22$, $p<.001$ for R&D Intensity and $t = 2.75$, $p<.01$ for trademarks). Group R&D Intensity (i.e., source of competitive advantage) was also a significant predictor of firm performance for ROI ($t = -2.82$, $p<.01$) and ROE ($t = -2.62$, $p<.05$). In contrast, trademarks (i.e., breadth of operations) did not significantly predict ROI ($t = 1.38$, $p = .18$) or ROE ($t = .35$, $p = .73$).

Table 13. Test of Group (i.e., main) Effects Controlling for Firm Resources (t-values)

	ROA	ROI	ROE	PE	Altman's Z
R&D Intensity (β_{01j})	-5.22***	-2.82**	-2.62*	.05	-2.68**
Trademarks (β_{02j})	2.75**	.18	.73	.04	.79

*p<0.05 **p<0.01 ***p<0.001
Note: Firm resources are grand mean centered, while strategic group characteristics are uncentered

(Coefficients)

	ROA	ROI	ROE	PE	Altman's Z
R&D Intensity (β_{01j})	-1.34***	-1.18**	-1.07*	.01	-.17**
Trademarks (β_{02j})	.99**	.79	.18	.01	.07

*p<0.05 **p<0.01 ***p<0.001
Note: Firm resources are grand mean centered, while strategic group characteristics are uncentered

For firm survival, group R&D Intensity (i.e., source of competitive advantage) significantly predicted Altman's Z ($t = -2.68$, $p<.01$), while the influence of trademarks (i.e., breadth of operations) was not significant ($t = .79$,$p = .43$). For market performance (i.e., PE), however, group measures were not significant ($t = .05$, $p = .96$ for R&D Intensity and $t = .04$, $p = .97$ for trademarks). Overall, mixed evidence is found for hypothesis 2.

Hypothesis 3 examined the degree to which group characteristics moderated resource influences on firm performance. Results for these tests are presented in table 14. Nine out of sixty (15%) possible moderator terms were significant. Considering financial performance, group R&D Intensity (i.e., source of competitive advantage) moderated the influence of intangible resources (i.e., patents and analysts' ratings) on ROA ($t = -2.02$, $p<.05$ for patents and $t =-3.41$, $p<.001$ for analysts' ratings) and approached significance for physical resources (i.e., percentage of foreign sales; $t = 1.69$, $p<.1$). Also, group trademarks (i.e., breadth of operations) moderated the effects of intangible resources (i.e., analysts' ratings) influence on performance ($t = -2.14$, $p<.05$). For ROE, group R&D Intensity (i.e., source of competitive advantage) moderated the effects of financial resources on performance ($t = 2.28$, $p<.05$ for current ratio and $t = -1.71$, $p<.1$ for debt-to-equity).

For market performance, group R&D Intensity (i.e., source of competitive advantage) moderated intangible resources (i.e., analysts' ratings; $t = -2.13$, $p<.05$) influence on performance and group trademarks (i.e., breadth of operations) moderated physical resource (i.e., percentage of foreign sales) influence on the price-earnings ratio ($t = -1.94$, $p<.05$). For organizational survival, group R&D Intensity (i.e., source of

Table 14. Test of Group (i.e., moderation) Effects on Firm Resources (t-values)

	ROA	ROI	ROE	PE	Altman's Z
R&D Intensity					
Capital Intensity (β_{11j})	-.44	-.17	.19	-.06	-2.52**
% Foreign Sales (β_{21j})	1.69†	1.24	.35	.09	.51
Patents (β_{31j})	-2.02*	-.99	-1.17	.20	1.37
Reputation (β_{41j})	-3.41***	-.90	.17	-2.13*	1.58
Current Ratio (β_{51j})	.17	.69	2.28*	-.84	-1.02
Debt-to-equity (β_{61j})	1.00	-.08	-1.73†	1.12	-.71
Trademarks					
Capital Intensity (β_{12j})	-.34	-.31	-.11	.19	.64
% Foreign Sales (β_{22j})	.96	1.14	.29	-1.94*	1.39
Patents (β_{32j})	-.49	.01	.49	.69	-.94
Reputation (β_{42j})	-2.14*	-.96	.07	.88	.60
Current Ratio (β_{52j})	-1.17	-.37	-.47	-1.02	-.12
Debt-to-equity (β_{62j})	-.99	-.08	-.55	.59	-1.39

†p<0.1 *p<0.05 **p<0.01 ***p<0.001

Note: Firm resources are group mean centered, while strategic group characteristics are uncentered

(Coefficients)

	ROA	ROI	ROE	PE	Altman's Z
R&D Intensity					
Capital Intensity (β_{11j})	-.01	-.01	.01	-.00	-.02**
% Foreign Sales (β_{21j})	.07†	.10	.03	.00	.01
Patents (β_{31j})	-.12*	-.11	-.13	.01	.02
Reputation (β_{41j})	-1.39***	-.69	.13	-.71*	.19
Current Ratio (β_{51j})	.01	.07	.23*	-.04	-.02
Debt-to-equity (β_{61j})	.01	-.00	-.03†	.01	-.00
Trademarks					
Capital Intensity (β_{12j})	-.03	-.06	-.02	.02	.02
% Foreign Sales (β_{22j})	.01	.03	.01	-.02*	.01
Patents (β_{32j})	-.03	.00	.05	.03	-.01
Reputation (β_{42j})	-.84*	-.71	.05	.29	.07
Current Ratio (β_{52j})	-.14	-.08	-.10	-.09	-.00
Debt-to-equity (β_{62j})	-.01	-.00	-.01	.00	-.00

†p<0.1 *p<0.05 **p<0.01 ***p<0.001

Note: Firm resources are group mean centered, while strategic group characteristics are uncentered

competitive advantage) moderated the influence of physical resources (i.e., capital intensity) on Altman's Z ($t = -2.52$, $p<.01$). Overall, several moderated relationships were found significant across performance measures. Thus, mixed evidence is found for hypothesis 3.

Hypothesis 4 tested the degree to which industry characteristics moderated the effects of group characteristics on firm performance. Results for this analysis are presented in table 15. For financial performance (i.e., ROA), both dynamism and complexity moderated the influence of group R&D Intensity (i.e., source of competitive advantage) on performance ($t = -2.69$, $p<.05$ for dynamism and $t = 2.26$, $p<.05$ for complexity) and there is some indication that munificence moderated the relation between group R&D Intensity and performance ($t = -1.75$, $p<.1$).

For market performance (i.e., PE), environmental munificence moderated group R&D Intensity (i.e., source of competitive advantage) on performance ($t = -2.89$, $p<.01$). Considering firm survival (i.e., Altman's Z), all environmental dimensions (i.e., munificence, dynamism, and complexity) approached or reached significance for the effect of group R&D Intensity (i.e., source of competitive advantage on performance; $t = -1.86$, $p<.1$ for munificence; $t = -1.71$, $p<.1$ for dynamism; $t = 1.99$, $p<.05$ for complexity). In sum, several moderated relationships for each type of performance (i.e., financial, market, and organizational survival) were significant (7 out of 30 possible; 23.3%), providing mixed evidence in support of hypothesis 4.

Table 15. Test of Industry (i.e., moderation) Effects on Group Characteristics (t-values)

	ROA	ROI	ROE	PE	Altman's Z
Munificence					
R&D Intensity (γ_{011})	-.23	.27	-1.42	-.61	-1.86†
Trademarks (γ_{021})	-1.75†	-.79	-.69	-2.89**	-.25
Dynamism					
R&D Intensity (γ_{012})	-2.69*	-.40	-.36	-.49	-1.71†
Trademarks (γ_{022})	-.12	.27	.54	-.18	-.71
Complexity					
R&D Intensity (γ_{013})	2.26*	-.04	-.57	.28	1.99*
Trademarks (γ_{023})	-.06	-.16	.97	.06	.28

†p<0.1 *p<0.05 **p<0.01 ***p<0.001

Note: strategic group characteristics are group mean centered, while industry characteristics are uncentered

(Coefficients)

	ROA	ROI	ROE	PE	Altman's Z
Munificence					
R&D Intensity (γ_{011})	-.77	1.53	-7.79	-1.49	-1.77†
Trademarks (γ_{021})	-2.26†	-1.77	-1.52	-2.84**	-.09
Dynamism					
R&D Intensity (γ_{012})	-256.22*	-63.83	-53.65	-33.08	-44.71†
Trademarks (γ_{022})	-1.26	4.84	9.39	-1.39	-2.12
Complexity					
R&D Intensity (γ_{013})	15.00*	-.49	-5.83	1.28	3.58*
Trademarks (γ_{023})	-.12	-.53	2.74	.08	.14

†p<0.1 *p<0.05 **p<0.01 ***p<0.001

Note: strategic group characteristics are group mean centered, while industry characteristics are uncentered

Discussion

Considerable effort in strategic management research has focused on understanding the influence of two levels of analysis – firms and industries – on firm performance. Results of this study suggest that understanding group phenomena is also critical for both empirical study as well as managerial attention. In the following sections I discuss the role played by multiple levels of influence on firm performance.

Multiple Performance Influences

Understanding the influences of firm performance is at the heart of strategic management (Keats & Hitt, 1988). A complete understanding requires integration of both resource-based and industrial organizational economic approaches to organizations (Collis, 1991). Accordingly, this study provides a comprehensive exploration of this approach by testing firm, strategic group, and industry influences on firm performance. The addition of the group level of analysis builds on considerable research investigating firm and industry influences on firm performance (e.g., Brush & Bromiley, 1997; Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Powell, 1996; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985). Two main findings emerge from the variance decomposition tests. First, significant variance exists at each level of analysis. Second, the amount of variance explained in firm performance is partially a function of how performance is conceptualized and defined. Next, I discuss these findings for each level of analysis (i.e., firms, strategic groups, and industries).

Overall, results indicate that managers' actions to uniquely position their firms in the market is a more powerful influence on firm performance than strategic group or industry effects. Relative to previous research, the results of this study found a much

stronger firm effect and therefore supports others who find the majority of variance in firm performance can be attributed to unique firm effects (e.g., Mauri & Michaels, 1998). However, these results are at odds with others who have detected marginal firm effects. For example, the 65% of the variation in financial performance (i.e., ROA) found here is considerably larger than Schmalensee's (1985) negligible corporate effect, Wernerfelt and Montgomery's (1988) 2.6% variance explained by firm diversification, and somewhat larger than Rumelt's (1991) 46% variation at the business level.

Several factors may account for the considerably larger amount of variance in performance at the firm level of analysis found in this study. One interpretation for this finding is that the use of the lagged time structure played a key role. The importance of time has been demonstrated by Rumelt (1991), who replicated an earlier work by Schmalensee (1985) using the same sample but multiple years of data and detected a considerably larger firm business effect (46% of the variation as compared to a negligible effect for Schmalensee). Another reason may be the decision to only sample single business firms. For example, McGahan and Porter (1997) did not include single business firms in their sample and found 31.71% of the variance was due to business segment effects while Mauri and Michaels (1998) relied exclusively on nondiversified firms and found as much as 36.9% of the variation was due to firm effects.

The HLM method used in this study also influenced study outcomes for multiple reasons. The variance components methods used by others used a series of nested ANOVA techniques to estimate multiple influences on firm performance. This estimation strategy has several undesirable limitations. For example, McGahan and Porter (1997) note that by not simultaneously estimating multiple effects, this

computational disadvantage introduces considerable "noise" into study findings. This has been demonstrated by findings that "error" makes up between 8.7% and 68.8% of the variance in performance (cf. Mauri & Michaels, 1998; Roquebert et al., 1996; Rumelt, 1991). By simultaneous estimation, the HLM method uses the variation in performance found at each level of analysis to partition variance (Bryk & Raudenbush, 1992). Thus, no "error" variance remains after the variance components are estimated (Bryk & Raudenbush, 1992). The use of such methods results in considerable parsimony in estimation procedures as compared to other studies testing similar relationships in the strategy literature. For example, Rumelt's fixed-effects ANOVA analysis necessitated the use of over 10,000 degrees of freedom while McGahan and Porter (1997) required over 50,000 degrees of freedom for their tests. In contrast, the HLM procedure used to test variance decomposition in this study required only 36 degrees of freedom. While the computation advantages of iterative HLM techniques are well-documented (Du Toit, 1995; Goldstein, 1986; Longford, 1987), this is the first study in the strategy literature to take advantage of such advancements.

The amount of variation in firm performance at each level of analysis varied markedly based on how performance was conceptualized (i.e., financial, market, survival) as well as operationalized. Among financial indicators of performance, 65.82% of the variation in ROA was at the firm level, compared to 86.53% for ROI and 90.57% for ROE. For both market performance (i.e., price-earnings ratio) and survival (i.e., Altman's Z), even more of the variation was attributable to the firm level of analysis. For market performance, 95.74% of the variation in PE was at the firm level. Similarly, 96.08% of Altman's Z (i.e., organizational survival) resides at the firm level. Findings

from these measures provide even stronger support for the idea that unique firm differences are the most critical driver of firm performance.

Conceptual as well as empirical explanations exist for why market performance and organizational were survival largely driven by firm, as opposed to group or industry phenomena. Market performance in this study was operationalized as the price-earnings ratio. Empirically, there is considerable variability in this measure within industries because a modest edge in earnings growth can results in a substantially higher multiple increase (Fridson, 1995). Conceptually, firm level decisions such as erratic changes in strategy also influence this measure substantially (Fridson, 1995). Similarly, organizational survival via bankruptcy is also subject to considerable discretion of individual firms. Once viewed as a sign of managerial failure, bankruptcy is becoming more accepted as a shrewd strategy for turnaround as 1978 legislation allows even solvent firms to take advantage of this legal maneuver (Tavakolian, 1995).

Although the majority of the variance in firm performance was attributable to the firm level of analysis, the influence of strategic groups was in several cases, considerable. Specifically, this study found that the addition of the strategic group level of analysis accounted for roughly 15% of the variance in the most commonly operationalized measure of firm performance – ROA. This component is comparable to the amount of variance many studies have found for the industry influence on performance (e.g., Mauri & Michaels, 1998; Roquebert et al., 1996; Rumelt, 1991; Wernerfelt & Montgomery, 1988) and more than what others found for firm effects (e.g., Schmalensee, 1985). This finding is also larger than the 8% of variance in firm performance found by Ketchen and colleagues (1997) meta-analytic review of the influence of organizational configurations

and performance. While some researchers have argued that firm, group, and industry context are all important for understanding firm performance, this is the first study to simultaneously test each of these components. The results from the variance decomposition suggest that previous researchers may have underspecified their models when conducting tests of the organization-environment interface, limiting our "true" understanding of firm performance.

Industry also consistently explained a significant component in the variance in firm performance. As with the firm and group effects, the amount of variance explained was a function of how performance was conceptualized. While industry effects accounted for between 10 and 20% of the variance in financial performance (i.e., ROA, ROI, ROE), a much smaller influence was found for other types of performance. Specifically, only 2.41% of the variance in market performance (i.e., price-earnings ratio) and 1.33% of the variance in organizational survival (i.e., Altman's Z) was at the industry level of analysis. This suggests that while the industry level of analysis is considerable for financial performance, its influence on market performance and survival is less impressive. Thus, the conclusion that industry effects are the primary influence on firm performance found by many studies may be overstated.

A substantially larger amount of variation in firm performance was found when performance was operationalized by measures beyond ROA. Indeed, at least 20% more variation was estimated at the firm level using other performance measures. The call for multiple measures of firm performance is not new to the field. Indeed, more than a decade ago Venkatraman and Ramanujam (1986) specifically called for operationalizations of firm performance beyond accounting based measures.

Despite the plea to move beyond accounting based performance measures, most studies of firm and industry influences on performance continue to rely solely on ROA as the dependent measure of performance (e.g., Brush et al., 1999; Mauri & Michaels, 1998; McGahan & Porter, 1997; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985). Findings from this study provide empirical evidence that this practice should be abandoned as it obscures differences that may be understood by profiling other salient performance types and measures. For example, more than twice the variance in both group and industry levels is found for ROA compared to other performance measures. This may be driven by the influence of assets – a generally accepted measure of firm size (cf., Weinzimmer et al., 1998). The influence of size has been demonstrated to be a strategic group mobility barrier that influences firm performance (Lewis & Thomas, 1990; Porter, 1979). As well, size has also been argued to be an industry entry barrier that influences firm performance (cf. Porter, 1980). In sum, results of this study support the notion that the complexity of organizational performance can only be understood through rich conceptualizations of the performance construct beyond financial returns such as ROA (Hubbard & Bromiley, 1995).

Group Main Effects

Results of the variance decomposition just discussed point to the important, yet often overlooked role played by the strategic group level of analysis in explaining variation in firm performance. These results focused on the extent of the level's influence but not on *how* the strategic group level impacts performance. This dissertation also examined the nature of strategic group influences on performance by identifying

group characteristics believed to predict variance in firm performance above and beyond the effects of firm resources.

Across financial performance (i.e., ROA, ROI, ROE) and organizational survival (i.e., Altman's Z), there was a significant negative relationship between group R&D Intensity (i.e., source of competitive advantage) and firm performance above and beyond any effect detected for firm resources. This suggests that irrespective of industry types, strategic groups that are characterized by efficiency (i.e., K-strategists) outperform other groups. For financial performance (i.e., ROA), there was also a significant positive effect for group trademarks (i.e., breadth of operations). In tandem with the negative significant effect for group R&D Intensity (i.e., source of competitive advantage) found for ROA, even more specific findings can be presented for this performance measure. That is, controlling for firm resource effects, the most high performing firms in terms of ROA focus on high domain breadth (i.e., trademarks) while maximizing efficiency (i.e., low source of competitive advantage as measured by group R&D Intensity). In terms of the Zammuto (1988) framework, these firms would be labeled as analyzers.

Overall, these findings provide a rigorous test of strategic group influences while controlling for resource-based explanations. By doing so, this study overcomes common criticisms of strategic groups research. The groups, defined by theoretical rationale, clearly differed in terms of performance. Also, results of this test answer the call of those who have explicitly advocated the analysis of group influences after controlling for resource-based explanations (Dranove et al., 1998). Hence, these significant findings may be used to improve our understanding of group influences on performance.

Group Moderation Effects

Results of the strategic groups analysis also suggest that group characteristics moderate the relationship between resource holdings and performance. Hence, this research builds on the work of others (e.g., Reger & Huff, 1993) who have argued that positioning within a strategic group is an important aspect of organizational strategy and firm performance. Specifically, results from this study suggest that the strength of the relation between firm resources and performance is often dependent on characteristics of the strategic group.

Several significant cases existed where strategic group characteristics moderated the effects of firm resources on firm performance. For example, in groups with high levels of R&D Intensity (i.e., innovation focus), the relationship between intangible resources and performance (i.e., ROA) was weaker than in groups with low levels of R&D Intensity (i.e., efficiency focus). A similar result was obtained for market performance. Also for market performance, managing physical resources (i.e., percentage of foreign sales) was more important for groups with fewer trademarks (i.e., niche groups) than groups with many trademarks (i.e., large operations breadth). Finally, for organizational survival, managing physical resources (i.e., capital intensity) is more important for firms with low group R&D Intensity (i.e., efficiency focus) than those with high group R&D Intensity (i.e., innovation focus). Overall, 9 of the 60 possible moderated relationships (15%) were significant.

The existence of such moderated relationships suggests that attaining superior performance is a complex process that involves understanding resource-based advantages that might accrue in the context of the specific group strategy that a firm is pursuing.

Consequently, managers must not only be aware of critical resources that may influence firm performance in their industry, but also how the efficacy of those resources may be enhanced or diminished by strategic group membership. This suggests that understanding performance vis-à-vis the resource-based view of the firm can not be accomplished by examining a firm's idiosyncratic resources alone. In contrast, managers need to be keenly aware of groups operating in their industry, and how those groups might change the effectiveness of certain resources. Only then, can managers uniquely position themselves in their competitive environments.

Industry Moderation Effects

The idea that environmental context influences organizational performance has been long accepted in the field. Many researchers have discussed the considerable role that environments play in affecting firm performance (e.g., Bain, 1956; Porter, 1981). More specifically, researchers have argued that key industry characteristics such as munificence, dynamism, and complexity be examined in strategy studies (Dess et al., 1990). Typically, studies have modeled the effects of industry as a direct influence on firm performance. This study adds to understanding of firm performance by testing the influence of industry characteristics on relations between strategic group membership and performance. Results of these tests shed light on how environmental context changes the influence of strategic group membership on performance.

A negative moderated relationship was detected between environmental dynamism and the efficacy of group R&D Intensity (i.e., source of competitive advantage) on financial performance (i.e., ROA). In dynamic environments, the relationship between efficiency focus (i.e., low group R&D Intensity) and performance is

weaker than in stable environments. Coupled with results from hypothesis 2 (firms in groups focusing on efficiency outperform firms in groups focusing on innovation) these results provide evidence for Burns and Stalker's (1961) structural contingency assertion that success of organizational types is a function of environmental conditions. Indeed, their "mechanistic" organizations who focus on task specialization and technical improvements are much akin to "K-specialist" firms in terms of Zammuto's (1988) categories based on strategic choice and population ecology literatures. As well, Burns and Stalker's "organic" organizational forms that constantly tackle fresh problems with unforeseen requirements are similar to population ecologists "r-specialists" who continually search for the new opportunities in their competitive environments. Given the strong tie between the findings of this study and theoretical basis found in the population ecology literature, perhaps it is not surprising that this finding also approached significance for organizational survival (i.e., Altman's Z).

For market performance (i.e., price-earnings ratio), there was a significant negative moderated relationship between environmental munificence and group trademarks (i.e., breadth of operations breath). Thus, as munificence increases the relationship between group operations breadth and performance weakens. This relationship also approached significance for financial performance (i.e., ROA). Results from hypothesis 2 detected a significant main effect between group trademarks (i.e., breadth of operations) and performance in terms of ROA. The significant negative moderated effect of munificence suggests that this relationship weakens when there is less environmental resource abundance (i.e., munificence is low). These results provide empirical support for Ketchen and colleagues (1993) who speculated that low

munificence would favor specialist groups (i.e., entrepreneurs and defenders) over generalist groups (i.e., prospectors and analyzers).

Finally, a positive moderated relationship was detected between environmental complexity and group R&D Intensity (i.e., source of competitive advantage) for both financial performance (i.e., ROA) and organizational survival (i.e., Altman's Z). Thus, while significant main effects found in tests of hypothesis 2 suggested that K-specialists (i.e., defenders and analyzers) tended to outperform r-specialists (i.e., entrepreneurs and prospectors), this relationship becomes even stronger as complexity decreases (i.e., industry concentration increases).

Summary and Conclusion

This study builds on others who argue that competitive advantage results from a series of connected decisions based on complex relationships between factors found at multiple levels of analysis (e.g., Stimpert & Duhaime, 1997a). A conventional interpretation of the results of the variance components analysis might conclude that because most of the variation exists at the firm level, that firm uniqueness is the critical area that "drives" firm performance differences. Such an interpretation tells only a portion of the story. Attaining superior performance is a complex process that requires an intimate understanding of industry environments, similarly acting competitors, and a firm's uniqueness. Given this premise, the driving characteristic of firm performance is positioning within both group and industry. Here, firm uniqueness is certainly key, but only when managers have a keen understanding of their industry environments and strategic group processes present in those environments.

This study's inclusion of multiple measures allows for rich comparison across indicators of performance, and may serve to challenge previous study findings. For example, results of this study found that the firm level of analysis explained most of the variation in firm performance across performance measures. As well, a significant amount of variation in performance was detected at the firm, group, and industry levels across performance measures. The amount of variation, however, varied considerably among levels and performance measures. Most notably, when industry effects were measured in terms of nonfinancial measures, their influence was considerably less than results found by previous researchers. While calls for the use of such performance measures are not new to the strategy field (cf., Venkatraman & Ramanujam, 1986), response to such calls has been slow. Future research could extend findings from this study by looking at other nonconventional performance measures. For example, economic value added has recently emerged as one of the more salient performance measures used to assess organizational performance by top executives (Bontis, Dragonetti, Jacobsen, & Roos, 1999). As well, corporate social performance is also a salient measure for many firms (Agle, Mitchell, & Sonnenfeld, 1999; Ruf, Muralidhar, & Paul, 1998; Waddock & Graves, 1997). The inclusion of such performance measures may provide additional insights in future inquiries.

In Rumelt's (1991) often-cited study of firm and industry influences on firm performance he asks the question, "how much does industry matter?" This study builds upon considerable research into influences on firm performance by asking, "how much do strategic groups matter?" The answer to this question may largely be in the eye of the beholder. On the one hand, group characteristics explained variation in firm performance

above and beyond firm resources and moderated the efficacy of other resource holdings. Despite this influence, most of the variation was at the firm, not industry or group, level of analysis. Overall, results suggest that firms' unique positioning both within their groups as well as industries is the most critical aspect that "drives" firm performance.

CONCLUSION

This dissertation incorporates insights from the resource-based view, strategic groups research, and industrial organizational economics to improve understanding of the determinants of organizational performance. Conceptual foundations suggested that understanding each view is necessary to fully comprehend the determinants of organizational performance. Results from both empirical studies validate this argument. In both the hospital sample, as well as the multi-industry sample, variation in organizational performance was detected at both the organizational and group levels of analysis. While both resource-based and strategic group explanations enhance understandings of organizational performance, this dissertation supports the notion that firm uniqueness is the key driver of performance. That is, how managers uniquely position their organization within their industry, as well as within a group of similarly acting competitors, is the critical determinant of organizational functioning.

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APPENDIX A: HIERARCHICAL LINEAR MODELING PROCEDURE FOR HOSPITAL DATA

The Hierarchical Linear Modeling (HLM) methodology used in this study involves a two-level approach (cf. Hofmann & Stetzer, 1998). The first level examines relationships among variables within strategic groups that generate intercept and slope parameters linking the within-group independent variables (i.e., hospital resources) to the outcome measure for each group (i.e., hospital performance). This model is analogous to the familiar linear regression, although the Bayes algorithm used to estimate the level-1 components is noted for its superior precision and reliability (Bryk & Raudenbush, 1992; Morris, 1983). The HLM algorithm is able to provide better estimates of the predictors of hospital outcomes within strategic groups by "borrowing" information about these relationships from other groups and hospitals (cf. Bryk, Raudenbush, & Congdon, 1996). In the level-2 model, the intercept and slope parameters are used as outcome variables and regressed on between-groups variables.

When estimated without predictor variables, the level-2 model is essentially a one-way analysis of variance (Hofmann, 1997). The HLM ANOVA model was used to test hypothesis 1 that investigates the amount of performance explained by organizational and group levels. This is accomplished by partitioning variance into within (i.e., hospital) and between (i.e., strategic group effect) group components (cf. Bryk & Raudenbush, 1992; Hofmann, 1997). The following set of equations will be estimated to conduct the variance partitioning in HLM:

Level-1: $Performance_{ij} = \beta_{0j} + r_{ij}$

Level-2: $\beta_{0j} = \gamma_{00} + U_{0j}$

Where $Performance_{ij}$ is the performance measure of a single dependent variable (e.g., ROA) for hospital i in group j. β_{0j} is the mean performance for group j, and γ_{00} is the grand mean performance (i.e., the mean of group means). In this set of equations, the level-1 equation includes no predictors and, therefore, the regression equation only includes an intercept estimate. The level-2 model regresses each strategic group's mean performance onto a constant; that is, β_{0j} is regressed onto a unit vector resulting in a γ_{00} parameter equal to the grand mean performance (i.e., the mean of group means, β_{0j}). The level-1 residual (i.e., r_{ij}) represents within group variance in performance. The level-2 residual (i.e., U_{0j}) represents any between group variance in performance. By calculating a ratio of the between group variance divided by the total variance in performance, HLM provides information on the percentage of the total variance in performance residing both within and between strategic groups (cf. Hofmann, 1997).

In addition to the ability to estimate variance components at multiple levels of analysis (i.e., hypothesis 1), HLM is also able to test the effects of multiple independent variables at each level. This feature is used to test hypothesis 2, which argues that strategic group characteristics have a direct affect on firm performance (above and beyond hospital resources). This was tested by adding strategic group level measures (i.e., group operations breadth and source of competitive advantage; γ_{01} and γ_{02}) at level-2

to predict group performance (β_{0j}). This can be specified with the following set of equations:

Level-1: $Performance_{ij} = \beta_{0j} + \beta_{1j}$(Capital Spending$ij$) + β_{2j}(Urban/Suburbanij) + β_{3j} (Direct Medical Expensesij) + β_{4j}(Ageij) + β_{5j}(Current Ratioij) + β_{6j}(Debt-to-total-assetsij) + r_{ij}

Level-2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (Percent routine patient days$j$) + γ_{02} (Number of services$j$) + U_{0j}

HLM provides a *t*-test for each level-2 parameter. This tests if each of the strategic group characteristics (i.e., γ_{01} and γ_{02}) has a significant main effect on performance ($Performance_{ij}$). If so, then firm performance can be explained by group characteristics. It is worth noting that when using HLM, variable "centering" affects substantive conclusions that can be drawn from empirical tests (Hofmann & Gavin, 1998; Kreft, De Leeuw, & Aiken, 1995). To control for level-1 variables, they are first "centered" around their grand means (Hofmann & Gavin, 1998). For example, when testing hypothesis 3, the level-1 variable that measures capital expenditures (e.g., β_{1j} Capital Spendingij) is modeled by subtracting the grand mean capital spending from the individual hospital's spending so that the level-1 variable is now modeled as β_{1j}(Capital Spendingij – Capital Spending ..) where Capital Spending .. represents the grand mean capital spending. Other independent variables are modeled in the same manner.

Hypotheses 3 argues that strategic group characteristics moderate relationships between firm resources and performance. This was tested by adding strategic group level measures at level-2 to predict significant independent variables at level-1. This is illustrated with the following set of equations:

Level-1: $Performance_{ij} = \beta_{0j} + \beta_{1j}$(Capital Spending$ij$) + β_{2j}(Urban/Suburbanij) + β_{3j} (Direct Medical Expensesij) + β_{4j}(Ageij) + β_{5j}(Current Ratioij) + β_{6j}(Debt-to-total-assetsij) + r_{ij}

Level-2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (Percent routine patient days$j$) + γ_{02} (Number of services$j$) + U_{0j}
$\beta_{1j} = \gamma_{10} + \gamma_{11}$ (Percent routine patient days$j$) + γ_{12} (Number of services$j$)
$\beta_{2j} = \gamma_{20} + \gamma_{21}$ (Percent routine patient days$j$) + γ_{22} (Number of services$j$)
$\beta_{3j} = \gamma_{30} + \gamma_{31}$ (Percent routine patient days$j$) + γ_{32} (Number of services$j$)
$\beta_{4j} = \gamma_{40} + \gamma_{41}$ (Percent routine patient days$j$) + γ_{42} (Number of services$j$)
$\beta_{5j} = \gamma_{50} + \gamma_{51}$ (Percent routine patient days$j$) + γ_{52} (Number of services$j$)
$\beta_{6j} = \gamma_{60} + \gamma_{61}$ (Percent routine patient days$j$) + γ_{62} (Number of services$j$)

The prediction of β_{1j} - β_{6j} by level-2 variables results in interaction terms that are estimates of cross-level effects. To test level-2 moderation, level-1 variables are "centered" around their group means. When group mean centering is used, significant level-2 variables indicate moderating or cross-level effects of strategic group characteristics on the firm resource—performance relationships examined at level-1 (cf. Hofmann & Gavin, 1998).

In sum, HLM allows for tests of (1) the amount of variance in hospital performance explained by organization uniqueness versus strategic group membership, (2) the main effects of strategic group characteristics on hospital performance and (3) the moderating role of strategic group characteristics on hospital resource-performance relationships.

APPENDIX B: HIERARCHICAL LINEAR MODELING PROCEDURE FOR COMPUSTAT DATA

A three level HLM model was used to test the effects of firms (level-1) nested within strategic groups (level-2) nested within industries (level-3). The simplest three-level model is a fully unconditional model (i.e., no predictors at any level). This model represents how variation in performance is allocated across the different levels of analysis (i.e., firm, strategic group, industry).

The level-1 model represents the performance for each firm as a function of a strategic group mean plus random error using the following equation:

$$Performance_{ijk} = \pi_{0jk} + e_{ijk},$$

where $Performance_{ijk}$ is the average performance for a single dependent variable (e.g., ROA) of firm i in strategic group j and industry k; π_{0jk} is the mean performance of strategic group j in industry k; e_{ijk} is a random "firm effect" that measures the deviation of firm ijk's score from the strategic group mean. These effects are assumed normally distributed with a mean of 0 and variance σ^2. The subscripts i, j, and k denote firms, strategic groups, and industries where there are $i = 1,2,\ldots, n_{jk}$ firms within strategic group j in industry k; $j = 1,2,\ldots,J_k$ strategic groups within industry k; and $k = 1,2,\ldots, K$ industries.

The level-2 model examines each strategic group mean, π_{0jk} as an outcome varying randomly around some industry mean using the following formula:

$$\pi_{0jk} = \beta_{00k} + r_{0jk},$$

where β_{00k} is the mean performance in industry k; r_{0jk} is a random "strategic group effect," that is, the deviation of strategic group jk's mean from the industry mean. These effects are assumed normally distributed with a mean of 0 and variance τ_π. Within each of the K industries, the variability among strategic groups is assumed the same.

The level-3 model represents the variability among industries. The industry mean, β_{00k}, varies randomly around a grand mean as presented in the following formula:

$$\beta_{00k} = \gamma_{000} + u_{00k},$$

where γ_{000} is the grand mean; u_{00k} is the random "industry effect," that is, the deviation of industry k's mean from the grand mean. These effects are assumed normally distributed with a mean of 0 and variance τ_β.

This simple three-level model partitions the total variability in the outcome $Performance_{ijk}$ into its three components: (level-1) among firms within strategic groups, σ^2; (level-2) among strategic groups within industries, τ_π ; and (level-3) among industries, τ_β. This partitioning allows for estimates of the proportion of variation that is within strategic groups, among strategic groups within industries, and among industries. Specifically,

$\sigma^2 / (\sigma^2 + \tau_\pi + \tau_\beta)$ is the proportion of variance within strategic groups;

$\tau_\pi / (\sigma^2 + \tau_\pi + \tau_\beta)$ is the proportion of variance among strategic groups within industries; and

$\tau_\beta / (\sigma^2 + \tau_\pi + \tau_\beta)$ is the proportion of variance among industries.

This fully unconditional model allows for estimation of variability associated with each of the three levels (i.e., firms, strategic groups, industries). This model provides for a direct test of hypothesis 1.

In addition to the ability to estimate variance components at multiple levels of analysis (i.e., hypothesis 1), HLM is also able to test the effects of multiple independent variables at each level. This feature is used to test hypothesis 2, which argues that strategic group characteristics have a direct affect on firm performance above and beyond firm resources. This was tested by adding strategic group level measures (i.e., group operations breadth and source of competitive advantage; β_{01j} and β_{02j}) at level-2 to predict group performance (π_{0jk}). This is illustrated by the following equation:

$$Performance_{ijk} = \pi_{0jk} + \pi_{1jk}(\text{Capital Intensity})_{ijk} + \pi_{2jk}(\text{Percent Foreign Sales})_{ijk} + \pi_{3jk}(\text{Patents})_{ijk} + \pi_{4jk}(\text{Reputation})_{ijk} + \pi_{5jk}(\text{Current Ratio})_{ijk} + \pi_{6jk}(\text{Debt-to-equity})_{ijk} + e_{ijk},$$

$$\pi_{0jk} = \beta_{00j} + \beta_{01j}(\text{R\&D Intensity})_{ij} + \beta_{02j}(\text{Trademarks})_{ij} + r_{0ij}$$

$$\beta_{00k} = \gamma_{000} + U_{00k}$$

HLM provides a *t*-test for each level-2 parameter. It is worth noting that when using HLM, centering decisions effect the substantive conclusions drawn from empirical tests (Hofmann & Gavin, 1998). To model the incremental effect of group characteristics beyond individual firm resources, level-1 variables are centered around their grand means (Hofmann & Gavin, 1998).

Hypotheses 3 argues that strategic group characteristics moderate relationships between firm resources and performance. This was tested by adding strategic group level measures at level-2 to predict significant independent variables at level-1. This is illustrated by the following equation:

$$Performance_{ijk} = \pi_{0jk} + \pi_{1jk}(\text{Capital Intensity})_{ijk} + \pi_{2jk}(\text{Percent Foreign Sales})_{ijk} + \pi_{3jk}(\text{Patents})_{ijk} + \pi_{4jk}(\text{Reputation})_{ijk} + \pi_{5jk}(\text{Current Ratio})_{ijk} + \pi_{6j}(\text{Debt-to-equity})_{ijk} + e_{ijk},$$

$$\pi_{0jk} = \beta_{00j} + \beta_{01j}(\text{R\&D Intensity})_{ij} + \beta_{02j}(\text{Trademarks})_{ij} + r_{0ij}$$
$$\pi_{1jk} = \beta_{10j} + \beta_{11j}(\text{R\&D Intensity})_{ij} + \beta_{12j}(\text{Trademarks})_{ij}$$
$$\pi_{2jk} = \beta_{20j} + \beta_{21j}(\text{R\&D Intensity})_{ij} + \beta_{22j}(\text{Trademarks})_{ij}$$
$$\pi_{3jk} = \beta_{30j} + \beta_{31j}(\text{R\&D Intensity})_{ij} + \beta_{32j}(\text{Trademarks})_{ij}$$
$$\pi_{4jk} = \beta_{40j} + \beta_{41j}(\text{R\&D Intensity})_{ij} + \beta_{42j}(\text{Trademarks})_{ij}$$
$$\pi_{5jk} = \beta_{50j} + \beta_{51j}(\text{R\&D Intensity})_{ij} + \beta_{52j}(\text{Trademarks})_{ij}$$
$$\pi_{6jk} = \beta_{60j} + \beta_{61j}(\text{R\&D Intensity})_{ij} + \beta_{62j}(\text{Trademarks})_{ij}$$

$$\beta_{00k} = \gamma_{000} + U_{00k}$$

Level-1 variables must be "centered" around their group means for significant level-2 variables to indicate a moderating or cross level effect (cf. Hofmann & Gavin, 1998).

Hypothesis 4 argues that industry characteristics moderate the relationship between strategic group characteristics and performance. To test this hypothesis, industry predictors at level-3 (i.e., munificence, dynamism, complexity) are used to predict group characteristics (i.e., β_{00j}, β_{01j} and β_{02j}) at level-2. Thus, the following additional equations are measured:

$$Performance_{ijk} = \pi_{0jk} + e_{ijk},$$

$$\pi_{0jk} = \beta_{00j} + \beta_{01j}(\text{R\&D Intensity})_{ij} + \beta_{02j}(\text{Trademarks})_{ij} + r_{0ij}$$

$$\beta_{00j} = \gamma_{000} + \gamma_{001}\,(\text{Munificence}) + \gamma_{002}\,(\text{Dynamism}) + \gamma_{003}\,(\text{Complexity}) + U_{00k}$$
$$\beta_{01j} = \gamma_{010} + \gamma_{011}\,(\text{Munificence}) + \gamma_{012}\,(\text{Dynamism}) + \gamma_{013}\,(\text{Complexity})$$
$$\beta_{02j} = \gamma_{020} + \gamma_{021}\,(\text{Munificence}) + \gamma_{022}\,(\text{Dynamism}) + \gamma_{023}\,(\text{Complexity})$$

Note that the equations estimating β_{01j} and β_{02j} at level-3 are nonrandomly varying (i.e., the U parameters are not estimated). Thus, I make the assumption that munificence, dynamism, and complexity "capture" the industry construct (c.f. Dess et al., 1990).

In sum, HLM allows for tests of (1) the amount of variance in firm performance explained by firms, strategic groups, and industries (2) the main effects of strategic group characteristics on performance controlling for firm resources (3) the moderating role of strategic group characteristics on firm resource-performance relationships, and (4) the moderating role of industry characteristics on strategic group characteristic — performance relationships.

VITA

Jeremy Collin Short was born into an upper middle class family in Dallas, Texas. His early years were primarily spent in Bedford, Texas – part of the Dallas/ Fort Worth metroplex.. Short graduated from Trinity High School in 1990, where after an unsuccessful attempt at varsity football, he rebounded to become a standout jazz and classical guitar player, achieving the "Best Jazz Soloist" award at Trinity High School, the first place district award in classical guitar and regional recognition as a member of the all-region jazz band his senior year. Short's early college years were marked by a lack of eventfulness, as he attended Tarrant County Junior College on academic scholarship. At TCJC, Short was involved in mid-cities Young Life, played in the jazz band, and was named a member of the Phi Theta Kappa honor society. After leaving TCJC, Short received his Bachelor of Business Administration degree in Management from the University of Texas at Arlington in 1994. Short went on to receive his Master of Business Administration degree from the University of North Texas in 1995, and the degree of Doctor of Philosphy in Business Administration at Louisiana State University in 2000, where he was inducted into the Beta Gamma Sigma honor society. Short will begin his career as an Assistant Professor at Portland State University in Portland, Oregon.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

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Major Field: Business Administration (Management)

Title of Dissertation: Resource-based, Strategic Group, and Industry Influences on Firm Performance

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

December 13, 1999